

ROYAL HOLLOWAY, UNIVERSITY OF LONDON

LASER SAFETY

POLICY AND PROCEDURE

(Version 3)

This Policy and Procedure sets out the College's management arrangements for the use of lasers. It requires that the potential for harm to staff, students and other persons from work with laser equipment is either prevented, or where that is not reasonably practicable, is adequately controlled.

There is currently no specific legislation devoted to lasers. However, the Health and Safety at Work Act 1974, and the Management of Health and Safety at Work Regulations 1999 impose clear obligations on the College to manage workplace hazards and risks, including laser. In addition, formal guidance exists in the British Standard BS EN60825-1, and other relevant documentation.

To achieve compliance with the requirements of this Policy and Procedure, the Council recognises the importance of its role in placing day-to-day responsibility with each head of department/school/director (hereafter referred to as 'managers'), assisted by their departmental health and safety co-ordinator. Each shall be responsible for identifying the role of staff and students in ensuring that the safe use of lasers is met and that they are adequately trained to meet such duties. Where it may lie outside of a manager's level of responsibility to take appropriate action (which may include funding), the matter must be referred without delay to the next level of management.

Members of staff and students will co-operate and comply at all times with the safety information, instruction and training provided and bring without delay to the attention of their line manager or health and safety co-ordinator any hazards identified, or improvements they think necessary. They do, therefore, have a duty to take reasonable care for the health and safety of themselves, and of other persons whom their acts or omissions may affect. They must co-operate with the College to enable it, or any other person, to comply with any duty or requirement imposed by the Health and Safety at Work Act 1974, and any other relevant statutory provisions.

Copies of those documents referred to above and other useful reference material are available from the College Laser Safety Officer. The British Standard BS EN60825-1 or the International Electrotechnical Commission (IEC) equivalent should be obtained by departments using lasers of Class 3B and above.

Section 1 – Procedure

In order to meet the requirements of this Policy and Procedure, managers shall ensure strict compliance with these requirements before a new activity involving work with a laser is introduced or changes to an existing activity takes place.

Managers shall, therefore, ensure that:

- (i) Any person required to work with lasers of Class 1M, 2M, 3 (including 3A, 3R, 3B, 3B*, 3B** & III) or Class 4 is authorised to undertake such activities. Such authorisation shall require completion of the College 'Laser Personal Registration' form (see Appendix 1) which shall be completed in full, signed by the user, and countersigned by the departmental Health and Safety Co-ordinator. Copies shall be retained in the department and with the College Laser Safety Officer.
- (ii) All lasers, except those of low power Class 1 and laser pointers of Class 2, are registered with the College Laser Safety Officer. Lasers shall be registered by completion of the College 'Registration of Laser' form (see Appendix 2). Any person wishing to bring a laser of Class 3 or 4 onto College premises, either by purchase, loan or transfer, must obtain written authorisation from the College Laser Safety Officer, at least 3 weeks prior to the delivery/arrival date.
- (iii) Prior to any new activity involving work with lasers being introduced, a full risk assessment (using the College 'General' Risk Assessment form) shall be conducted. Covering all aspects of the use of the laser, the assessment shall be conducted by a member of the manager's staff. The College Laser Safety Officer shall provide such advice and assistance as may be necessary.

N.B - The College 'Laser Survey' form (see Appendix 4) can be used to assist with the risk assessment process. It identifies essential control measures as required by BS EN60825-1. The risk assessment should investigate each of the control measures and assess their level of compliance.

- (iv) Where the risk assessment identifies that equipment, facilities, etc. are required which are outside those currently provided, then the laser shall not be brought into service until the requirements identified to be necessary by the risk assessment have been introduced and can be used safely by the relevant staff.
- (v) Completed risk assessment sheets, and other relevant documentation (i.e. 'Schemes of Work', Codes of Safe Working Practice, etc.) shall be held in the immediate vicinity in which the laser is in use. This will ensure they are available for reference purposes including use, and such other means as may be appropriate for the restriction of exposure.
- (vi) Where work with lasers has to be undertaken, action is taken to ensure that exposure is restricted so far as reasonably practicable. This will be achieved by ensuring that the following hierarchy of risk control measures is in place:
 - Engineering Controls – firstly take action to control exposure to staff, students and others by engineering controls.
 - Safe systems of work – then consider the use of safe systems of work, such as information, instruction and training, supervision, written schemes of work, etc.

- Personal Protective Equipment – lastly, where reasonably practicable, provide personal protective equipment to further restrict exposure.
- (vii) Where it is legitimate to resort to personal protective equipment, this shall conform to current European Union Product/Design requirements. The College Laser Safety Officer shall be available for advice on the selection of adequate and suitable personal protective equipment for restricting exposure.¹
- (viii) A ‘Scheme of Work’ is produced for all work involving lasers of Class 3B, 3B** and 4, where the beam paths are not totally enclosed (see Appendix 3). The scheme will identify the necessary precautions for the containment of laser light inside the experimental area in order to ensure the protection of users and others. In addition, it will identify all personnel who are authorised to use the laser.

Section 2 – Undergraduate work with lasers

Undergraduate work with lasers should, where practicable, be restricted to Class 1, 1M, 2, 2M, 3A or 3B*. Where this is not practicable, undergraduates shall only work with Lasers of Class 3R, 3B, 3B** or 4, following the agreement of the College Laser Safety Officer, who will assist their supervisor in identifying any additional control measures necessary from the risk assessment conducted under Section 1(i). In accordance with Section 1(i), the College Laser Safety Officer will ensure that they are registered as laser users. Students using lasers of these classes must not use them at any time when unsupervised.

Lasers must not be accessible to undergraduates at any time other than when they are being used as part of approved experimental work.

It is important to introduce students to good safety practice and the DLSO and the lecturer in charge should conduct a risk assessment and draw up a written scheme of work for each experiment or demonstration. A copy of this scheme should be displayed in a position where it can be clearly seen by persons carrying out the experiment or demonstration. In addition clear written instructions should be provided for each student experiment.

Section 3 – Information, Instruction and Training

It is the responsibility of managers to ensure that all staff and students who are required to work with lasers are provided with such information, instruction and training (including refresher training) that is suitable and sufficient for them to operate safely.

As a minimum, the following training standards shall, therefore, apply:

- All Principal Investigators and Research Assistants using lasers of Class 3B, 3B** or 4, shall attend a training course provided by the College Laser Safety Officer, or an equivalent.

¹ It is essential that where the risk assessment identifies the need for protective eyewear, this must provide protection against the specified wavelength and power of the laser beam. Where the need for protective clothing is identified, then the hands and forearms are the areas most at risk and must, therefore, be covered.

- Other users of Class 3B, 3B** or 4 (i.e. postgraduates and undergraduates) will be given training by the College Laser Safety Officer (LSO), followed by further instruction from their supervisor.
- Staff who use laser pointers that are class 2 do not have to be registered but should be issued with the Code of Practice for using laser pointers.

All registered laser workers using lasers of class 3B or above should read section 3 of IEC 60825-1 and any other relevant sections of this document as they identify important aspects of laser safety.

Principle Investigators must ensure that staff under their supervision who use lasers are issued with relevant codes of practice and schemes of work.

Section 4 – Eye examinations

Initial and routine eye examinations for laser users are no longer required although if a new worker requests one then this can be arranged through the Health and Safety Office.

If there should be a case of suspected eye damage from a laser then the Health Centre and the Health and Safety Office must be informed immediately. The Health Centre will conduct an assessment of the injury, and if necessary, arrange for an eye examination to be carried out within 24 hours at an appropriate hospital.

Section 5 – Laser pointers and pens

Laser pointers and pens are now widely used as a teaching aid, but if used inappropriately, have the potential to cause harm. Managers shall ensure that staff and students who use laser pointers are provided with the necessary information, instruction, and where necessary training, to be able to use such equipment safely.

The following standards shall, therefore, apply:

- For laser pointers up to and including Class 2, each user shall be issued with a copy of the College's Laser Pointer Code of Practice (see Appendix 5).
- Laser pointers and pens above Class 2 are a significant risk to persons and their use is, therefore, not allowed.

Section 6 – The use of lasers for entertainment and display purposes

Lasers that are used for display purposes are of a very high power and can cause serious injury. It is important that all persons attending such a display must be protected from either accidental or reckless exposure. Lasers that are used on campus for display purposes must be operated in accordance with the HSE guidance document HS(G)95 – 'The Radiation Safety of Lasers Used for Display Purposes.

Andy Alway
College Laser Safety Officer
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