



Laser Safety Policy and Procedure

(Version 5)

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Introduction

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.

The Control of Artificial Optical Radiation at Work Regulations 2010 is the principle health and safety legislation relating to the control of risks from lasers. Furthermore, 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 lasers. In addition, the Health and Safety Executive (HSE) has published an information sheet entitled 'Guidance for Employers on the Control of Artificial Optical Radiation at Work Regulations (AOR) 2010'. This document explains the steps that are required to protect workers from artificial optical radiation and comply with existing Regulations. Formal guidance also exists in the British Standard BS EN60825-1, and other relevant documentation.

This Policy and Procedure should not be considered a definitive guide to the management of lasers and the requirements of the Regulations. Where any doubt exists as to the action to be taken, or advice or assistance is required, contact should be made with the College Laser Safety Officer.

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 purchased by departments using lasers of Class 3A and above.

Objectives

1. Compliance with the requirements of this Policy and Procedure will ensure:
 - a) The College meets its obligations in respect of legislation
 - b) The safe management of lasers and laser devices
 - c) That exposure to non-ionising radiation is kept 'as low as reasonably practicable'
 - d) Everyone is aware of their roles and responsibilities
 - e) The safety and health of staff and students whilst working with lasers
 - f) The safety and health of others (including contractors, visitors, members of the public) is not compromised by those persons working with lasers
 - g) That staff, students and others who are authorised to work with lasers are appropriately informed, instructed, and where necessary trained and supervised.

Roles and Responsibilities

2. In meeting its statutory obligations, the College has instituted the following organisational arrangements:
3. Heads of Department/School/Directors (hereafter referred to as 'managers') have overall responsibility for implementing the requirements of this Policy and Procedure, including:
 - Informing their staff and others within their area of responsibility that they must comply with the requirements of this Policy and Procedure
 - Ensuring that risks associated with lasers are assessed and managed
 - Ensuring, where applicable, any person who is required to work with lasers is authorised
 - The provision of appropriate information, instruction, and where necessary training and supervision to users of lasers
 - Appointing one or more departmental Laser Safety Officers to assist them with the execution of their responsibilities
 - Implementing procedures for reporting any incidents or accidents involving lasers.
4. Where it may lie outside of a managers level of responsibility to take appropriate action (which may include funding), the matter must be referred to the next level of management.

5. Departmental Laser Safety Officers (DLSO) are responsible for:
 - Undertaking the specified duties identified in [Appendix 1](#).
6. The College Laser Safety Officer (LSO) is responsible for:
 - Undertaking the duties specified within his/her job description
 - Working with DLSOs to implement, monitor and review the management arrangements identified in this Policy and Procedure.
7. The Director of Health and Safety is responsible for:
 - Appointing the College Laser Safety Officer
 - Producing an annual report to College Council on compliance with the requirements of this Policy and Procedure.
8. Any person who works with lasers must:
 - Comply with the requirements of this Policy and Procedure
 - Work in accordance with the findings of any risk assessment, and the requirements of any information, instruction and training, including 'Codes of Practice'
 - Immediately report to their DLSO any accident or incident involving lasers
 - Bring, without delay, to the attention of their DLSO any hazards identified or improvements they think necessary.
9. The Radiation Safety Group, as a sub-committee of the Health and Safety Consultative Committee, will monitor and review the College's arrangements for the management of lasers, including compliance with the Regulations and this Policy and Procedure.
10. For the Membership and Constitution of the Group see [Appendix 2](#).

General Requirements

11. The following provisions will apply to work with lasers and laser devices:

Departmental Laser Safety Officers

12. Managers will appoint one or more Departmental Laser Safety Officers (DLSO) where lasers of Class 3A or above are used. A DLSO will also be appointed where lasers embedded in equipment, when serviced, could expose persons to laser radiation of Class 3A and above. This person will be a suitably qualified and experienced member of the manager's staff. The College Laser Safety Officer must be informed in writing of any appointment and will ensure that the individual has received sufficient training to carry out their role effectively.
13. The specific duties of DLSOs are identified in [Appendix 1](#).

Authorisation to work with lasers

14. Any person required to work with lasers of Class 1M, 2M, 3 (including 3A, 3R, 3B, 3B*, 3B** & III) or Class 4 must be authorised to undertake such activities. Such authorisation shall require completion of the College 'Laser Personal Registration' form (see [Appendix 3](#)) which shall be completed in full, signed by the user, and countersigned by the DLSO. Copies of completed forms will be retained in the department and with the College Laser Safety Officer.

Registration, Acquisition and Purchase of Lasers

15. Managers will ensure that all lasers (except those of low power Class 1 and laser pointers of Class 2¹) are registered with the College Laser Safety Officer by completing the College's 'Registration of Laser' form (see [Appendix 4](#)). 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.
16. Where a laser is to be purchased, this permission must be sought no less than 3 weeks before the order is placed. Where a laser is to be transferred from another establishment, this permission must be sought no less than 3 weeks before the recipient formally agrees to the transfer. This time period will allow the College Laser Safety Officer to assess any safety requirements of the laser.

Disposal of lasers

17. Managers will ensure that the College Laser Safety Officer is informed before a laser is to be disposed of. Some lasers contain harmful substances and must be disposed of through a licenced waste contractor and the Laser Safety Officer will be able to give advice on requirements.

Risk Assessment

18. 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 will be conducted by a member of the manager's staff. The College Laser Safety Officer will provide such advice and assistance as may be necessary.
19. The College 'Laser Survey' form (see [Appendix 5](#)) and accompanying notes (see [Appendix 6](#)) 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.
20. Where the risk assessment identifies that risk controls are required which are outside those currently provided, then the laser shall not be brought into service/use until the requirements identified to be necessary by this assessment have been implemented.
21. Completed risk assessments, and other relevant documentation (i.e. Codes of Practice) shall be held in the immediate vicinity in which the laser is in use. This will ensure they are available for reference purposes during use, and such other means as may be appropriate for the restriction of exposure.

Restriction of Exposure

22. Where work with lasers is to be carried out, managers will take all necessary steps 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:
 - (i) Engineering Controls – firstly take action to control exposure to staff, students and others by engineering controls.
 - (ii) Safe systems of work – then consider the use of safe systems of work, such as information, instruction and training, supervision, written codes of practice, etc.
 - (iii) Personal Protective Equipment – in the event that exposure cannot be adequately controlled by engineering controls and safe systems of work, personal protective equipment must be provided to further restrict exposure.

¹ The definition of laser pointers includes distance measures, spirit levels, temperature measuring devices and other device where a Class 2 laser is used for targeting, and where Class 2 is the maximum output of the device.

Personal Protective Equipment

23. Where it is legitimate to resort to personal protective equipment, this will conform to current European Union Product/Design requirements. The College Laser Safety Officer will be available for advice on the selection of adequate and suitable personal protective equipment for restricting exposure.²

Code of Practice

24. A 'Code of Practice' must be produced for all work involving lasers of Class 3B, 3B** and 4, where the beam paths are not totally enclosed. The Code 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.

Undergraduate work with lasers

25. Undergraduate work with lasers should, where practicable, be restricted to Classes 1 and 2. Where this is not practicable, undergraduates will only work with lasers of Class 1M, 2M, 3A, 3R, 3B, 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 paragraph 16 above. In accordance with paragraph 14, the College Laser Safety Officer will ensure that undergraduates carrying out this work are registered. Students must not use lasers of these classes at any time when unsupervised.
26. Lasers must not be accessible to undergraduates at any time other than when they are being used as part of approved experimental work.
27. 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 'Code of Practice' for each experiment or demonstration. A copy of this code of practice 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.

Information, Instruction and Training

28. It is the responsibility of managers to ensure that all staff, students and others 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 know and understand the risks to health created by exposure and the precautions identified as necessary to ensure safe use.
29. As a minimum, the following training standards will, therefore, apply:
- All Principal Investigators and Research Assistants using lasers of Class 3A, 3R, 3B, 3B*, 3B** or 4, must attend a training course provided by the College Laser Safety Officer, or equivalent.
 - Other users of Class 3A, 3R, 3B, 3B*, 3B** or 4 (i.e. postgraduates and undergraduates) will be given training by the College Laser Safety Officer (LSO), followed by further instruction on use of the equipment from their supervisor.
 - Staff who use laser pointers that are Class 2 do not have to be registered but must be issued with the [Code of Practice for Laser Pointers and Pens](#) (see also Paragraphs 32 and 33).

² 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 appropriately covered.

30. In addition, 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.
31. Principle Investigators must also ensure that staff under their supervision who use lasers are issued with relevant Codes of Practice.

Eye examinations

32. Initial and routine eye examinations for laser users are not required although if a new worker requests one then this can be arranged. Most new workers will be classed as display screen equipment users and may have already had an eye examination.
33. Any case of suspected eye damage from a laser must be reported immediately to the College Health Centre and the Director of Health and Safety. 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.

Laser pointers and pens

34. 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.
35. The following standards will, therefore, apply:
 - For laser pointers up to and including Class 2, each user shall be issued with a copy of the College's Code of Practice for Laser Pointers and Pens (see [Appendix 7](#)).
 - Lasers pointers and pens above Class 2 are a significant risk to persons and their use is, therefore, prohibited.
 - Students should not use any personally owned laser pointers. If they require one for a talk or presentation, then this should be issued by the relevant department.
 - Visiting lecturers may use their own laser pointers provided that they are Class 2 or below. The visitor must be issued with the [Code of Practice](#) before any lecture.

The use of lasers for entertainment and display purposes

36. Lasers that are used for display purposes are of a very high power and have the potential to cause serious injury. 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'.
37. Further advice on the use of such lasers can be obtained from the College Laser Safety Officer.

Departmental Compliance with this College Policy and Procedure

38. Departmental compliance with the requirements of this Policy and Procedure will be reviewed by the College Laser Safety Officer during the health and safety audit process.
39. This Policy and Procedure forms part of the College Health and Safety Policy.

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Version 5

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