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1. Introduction

This Policy and Procedure sets out RHSU'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. Formal guidance also exists in the British Standard BS EN60825-1, and other relevant documentation. The Health and Safety at Work Act 1974, and the Management of Health and Safety at Work Regulations 1999 also impose clear obligations on employers to manage workplace hazards and risks, including lasers.

RHSU is committed to ensuring:

i. We meet our obligations in respect of legislation
ii. The safe management of lasers and laser devices
iii. That exposure to non-ionising radiation is kept 'as low as reasonably practicable'
iv. That everyone is aware of their roles and responsibilities
v. The safety and health of staff and students working with lasers
vi. The safety and health of others (including contractors, visitors, members of the public) is not compromised by those persons working with lasers
vii. That staff, students and others who are authorised to work with lasers are appropriately informed, instructed and where necessary trained and supervised.

This policy and procedure should not be considered a definitive guide to the management of lasers. Where any doubts exist as to the action to be taken, or further advice or assistance is required, the College Laser Safety Officer should be contacted.

The British Standard BS EN60825-1 or the International Electro technical Commission (IEC) equivalent should be purchased if using lasers of Class 3A and above.

2. What is a laser?

The word 'laser' is an acronym for Light Amplification by the Stimulated Emission of Radiation. Lasers come in various forms and have many uses at work, in the home and for leisure.

Lasers emit radiation as narrow concentrated beams of light, not necessarily visible to the human eye. Their most commonly recognised hazard is their ability to damage eyesight or burn skin, which can vary markedly according to the wavelength and power of the output. However, in some cases, other associated risks from use of the equipment may be more hazardous such as heat, dust and fumes.

3. Employer Responsibilities

This policy will be managed on behalf of Royal Holloway Students' Union (RHSU) by the Assistant Venue Operations Manager (Technical & Events).

Managers have overall responsibility for implementing the requirements of this policy, including:

i. Informing their staff and others within their areas of responsibility that they must comply with the requirements of this Policy and Procedure
ii. Ensuring that the risks associated with the use of lasers are assessed and managed.
iii. Where applicable, ensuring that anyone who is required to work with lasers is authorised to do so.
iv. The provision of appropriate information, training and supervision to users of lasers.
v. Implementing procedures for reporting any incidents or accidents involving lasers.

4. Registration, Acquisition and Purchase of Lasers

The Assistant Venue Operations Manager (Technical & Events) will ensure that all lasers (except those of low power Class 1 and laser pointers of Class 2) are registered with the College Laser Safety Officer by completing the College's 'Registration of Laser' form.

Any person wishing to bring a laser of Class 3 or 4 onto the premises, either by purchase, loan or hire, must notify the Assistant Venue Operations Manager (Technical & Events), who will obtain written authorisation from the College Laser Safety Officer, at least three weeks prior to the delivery/arrival date.

5. Authorisation to work with lasers

Any persons who works with lasers must comply with the requirements of this Policy and Procedure; work in accordance with the findings of any risk assessment; bring without delay to the attention of the Assistant Venue Operations Manager (Technical & Events) any hazards identified or improvements they think necessary; and immediately report to the Assistant Venue Operations Manager Technical & Events) any accident or incident involving lasers.

Work with Class 1, 1M, 2 and 2M lasers may be carried out by any student, staff or visitor, providing they have received clearance from the Assistant Venue Operations Manager (Technical & Events). Class 3A/3R, 3B and 4 lasers may only be utilised by trained student staff Technical Crew and those who have received appropriate training.

6. Risk Assessment

Prior to new activity involving work with lasers being introduced, a full risk assessment, using the General Risk Assessment form, shall be conducted. Any such risk assessment may only be undertaken by a trained risk assessor and should always be signed off by the Assistant Venue Operations Manager (Technical & Events).

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.

Completed risk assessments shall be held in the immediate vicinity in which the laser is in use to ensure it is available for reference purposes during use.

7. Restriction of Exposure

Where work with lasers is to be carried out, the Assistant Venue Operations Manager (Technical & Events) will take all the necessary steps to ensure that exposure is restricted and ensure the following risk control measures are in place:

i. Engineering Controls – taking action to control exposure to staff, students and others by engineering controls.
ii. Safe Systems of Work – providing information, training and supervision.
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.

8. Training

It is the responsibility of managers to ensure that all staff, students and others who are required to work with lasers are provided with relevant information and 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.

Appendix 1

Simple Classification of Lasers

The British Standard BS EN 60825-1:2014 'Safety of Laser Products Part 1: Equipment Classification and Requirements' classifies laser products according to the laser beam hazard. Brief definitions are:

Class 1
Normally safe, but avoid prolonged eye exposure to the beam. For embedded lasers of a higher class, follow instructions on labels supplied by the manufacturer.

Class 1M
Due to their diverging beams or very low power density, Class 1M lasers do not pose a hazard in normal use. However, they may be hazardous to the eyes if viewed using gathering optics like magnifying glasses or telescopes, so these should be avoided.

Class 2
They are safe for accidental viewing as the eye is protected by aversion responses, including the blink reflex. This reaction may be expected to provide adequate protection under reasonably foreseeable conditions of operation including the use of optical instruments for intrabeam viewing.

Class 2M
Due to their diverging beams, Class 2M lasers do not pose a hazard greater than that of a Class 2 laser. However, they may be hazardous to the eyes if viewed using gathering optics like magnifying glasses or telescopes, so these should be avoided.

Class 3A (also known as 3R)
Direct intrabeam viewing is potentially hazardous but the risk is lower than for Class 3B lasers, and fewer control measures for the user apply. Avoid direct eye exposure to the beam and only use in an enclosed area.

Class 3B
Eye damage is likely to occur if the beam is viewed directly or if reflected from shiny surfaces. Prevent eye and, in some cases, skin exposure to the beam, and guard against unintentional beam reflections. A risk assessment is required before use, to determine protective measures necessary to ensure safe operation.

Class 4
Eye and skin damage likely from the main laser beam, as well as scattered and reflected beams. These lasers may cause fires. Prevent eye and skin exposure to the beam, and to diffuse reflections or scattering of the beam. Protect against beam interaction hazards such as fire and fume. A risk assessment is required before use, to determine the protective measures necessary to ensure safe operation.