

# University Occupational Health and Safety Standard

## ARTIFICIAL OPTICAL RADIATION

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<b>1.</b>	<b>PURPOSE</b> .....	<b>2</b>
<b>2.</b>	<b>SCOPE</b> .....	<b>2</b>
<b>3.</b>	<b>ABBREVIATIONS</b> .....	<b>2</b>
<b>4.</b>	<b>DEFINITIONS</b> .....	<b>2</b>
<b>5.</b>	<b>ROLES AND RESPONSIBILITIES</b> .....	<b>3</b>
<b>6.</b>	<b>MANAGEMENT OF LASER LIGHT SOURCES</b> .....	<b>5</b>
6.1	Risk Assessment.....	5
6.2	Information, Instruction, Training and Supervision .....	6
6.3	Procurement of Hazardous Lasers and Laser Devices .....	6
6.4	Inventory of Lasers and Laser Devices .....	7
6.5	Maintenance and Testing of Lasers Safety Equipment .....	7
6.6	Laser Pointers .....	7
6.7	Emergency planning and accident/incident reporting .....	7
6.8	Safe Use of Lasers and Laser Devices .....	8
<b>7.</b>	<b>MANAGEMENT OF NON-COHERENT LIGHT SOURCES</b> .....	<b>8</b>
7.1	Non-Coherent Light Sources Risk Assessments.....	8
7.2	Types of Non-Coherent Light Sources .....	8
7.3	Information, Instruction, Training and Supervision .....	9
7.4	Maintenance and testing of non-coherent light source safety equipment .....	9
7.5	Procurement of Non-Coherent Light Sources.....	10
7.6	Safe Use of Non-Coherent Light Sources .....	10
<b>8.</b>	<b>ACCESS TO HAZARDOUS LIGHT FACILITIES</b> .....	<b>11</b>
<b>9.</b>	<b>DISPOSAL OF HAZARDOUS LIGHT SOURCES</b> .....	<b>12</b>
<b>10.</b>	<b>PERFORMANCE MONITORING</b> .....	<b>12</b>
<b>11.</b>	<b>DOCUMENTATION AND RECORDS</b> .....	<b>13</b>
<b>12.</b>	<b>COMMUNICATION AND REPORTING</b> .....	<b>13</b>
<b>13.</b>	<b>TOOLS</b> .....	<b>13</b>
<b>14.</b>	<b>COMPLIANCE</b> .....	<b>13</b>
<b>15.</b>	<b>DOCUMENT HISTORY</b> .....	<b>13</b>

## 1. PURPOSE

The University is committed to meeting its legal obligations by ensuring that it has adequate arrangements, facilities and trained personnel to reduce the risk of injury or ill health from work activities involving artificial optical radiation hazards.

This document sets out the minimum requirements to control risk associated with work activities involving artificial optical radiation hazards at the University of Strathclyde, in order to comply with relevant legislative obligations and University requirements.

## 2. SCOPE

This document applies to all staff, students, post graduate students and visitors (for example visiting academics) who either work with hazardous light sources or who work in an area where such a source may be found, or those who have managerial responsibilities for the use of such light sources at the University of Strathclyde.

## 3. ABBREVIATIONS

<b>AOR</b>	Artificial Optical Radiation
<b>AEL</b>	Accessible Emission Limit
<b>CAORW10</b>	Control of Artificial Optical Radiation at Work Regulations 2010
<b>CTLD</b>	Consumer Type Laser Device
<b>DLPS</b>	Departmental Laser Protection Supervisor
<b>FMS</b>	Financial Management System
<b>HoD</b>	Head of Department
<b>IR</b>	Infrared
<b>LCA</b>	Laser Controlled Area
<b>MPE</b>	Maximum Permissible Exposure
<b>N-CTLD</b>	Non-Consumer Type Laser Device
<b>SHaW</b>	Safety, Health and Wellbeing
<b>URPO</b>	University Radiation Protection Officer
<b>UV</b>	Ultraviolet

## 4. DEFINITIONS

- 4.1 Artificial Optical Radiation** – any form of optical radiation, including ultraviolet and infrared, that is generated by a non-natural source.
- 4.2 Accessible Emission Limit** - the maximum accessible emission level permitted within a particular class. The AEL is determined as a product of the maximum permissible exposure (MPE) times an area factor called the limiting aperture (LA). The LA is dependent on laser wavelength pupil size.  $AEL = MPE \times \text{area of LA}$ .
- 4.3 CAORW 10** – the UK legislation governing the use of all forms of artificial optical radiation in the workplace.
- 4.4 Consumer Type Laser Device** – any device which is intended for consumer use, and can be found for sale to the public. Examples include DVD players or laser printers.
- 4.5 Hazardous Laser** – any laser, where the engineered controls have not been able to reduce the beam that someone may be exposed to, to less than the MPE of a Class 2 laser.
- 4.6 Hazardous Light** – any light (whether visible or invisible) whose wavelength falls into the range of 10nm to 1mm that is hazardous naturally, such as UV or IR light, or is processed in such a way by equipment that it becomes hazardous because of this processing (i.e. formed into a laser beam).
- 4.7 Infrared Light** – any light that occupies the wavelength region of over 700nm. IR can be subdivided into three categories, IR-A (700 – 1400nm), IR-B (1400nm – 3000nm) and IR-C (3000nm – 1mm).
- 4.8 Laser** – a device that is designed to emit a beam of coherent, monochromatic light. These beams typically have a narrow divergence over large distances.
- 4.9 Laser Device** – any piece of equipment that contains a laser of any given type, but is of such construction that under normal use, no person is likely to be exposed to laser radiation.

- 4.10 Laser Controlled area** – any area where a Class 3B or Class 4 laser is in use, but the engineering control measures that are in place do not remove the risk of persons being exposed to laser light entirely.
- 4.11 Maximum Permissible Exposures** - the maximum level of exposure that a worker may be exposed to, and is the point of exposure where a person may begin to expect to suffer some form of physical harm.
- 4.12 Non-Consumer Type Laser Device** – any device which is not intended for normal consumer use, but may be available for general purchase, which contains a Class 3 or Class 4 laser. Examples include laser cutters, engravers or laser display equipment.
- 4.13 Reputable supplier / Manufacturer** – any supplier or manufacturer of a hazardous light source who is able to provide evidence of the standards they have used in determining the classification of the light source.
- 4.14 Ultraviolet Light** – any light that occupies the wavelength region of 10 – 400nm. UV can be subdivided into further categories, UV-A (315 – 400nm), UV-B (280 – 315nm) and UV-C (100 – 280nm).
- 4.15 Wavelength** – the distance between two consecutive crests of a wave. In regards to lasers, this is measured in nanometres (nm) and is represented by the symbol  $\lambda$ .

## 5. ROLES AND RESPONSIBILITIES

The University [OHS Standard for Roles, Responsibilities and Accountabilities](#) defines the roles, responsibilities and accountabilities necessary to implement the Occupational Health, Safety and Wellbeing Policy Statement at each level of the organisation.

Specific roles, responsibilities and duties for the safe operation of hazardous light sources are detailed below:

### 5.1 Executive Deans

Responsible for performance monitoring of this Standard within their area of control including the University's significant partnerships, collaborations and wholly owned companies. They must ensure that departments are resourced such that this Standard is fully implemented.

### 5.2 Heads of Department / Heads of School / Professional Services Directors

Responsible for ensuring compliance with this Standard throughout their area of responsibility through provision of adequate resources and performance monitoring.

Supported by their nominated DLPS, they must ensure that:

- appropriate management, administrative and technical arrangements are in place to effectively control the risks arising from activities involving the use of any hazardous light sources to ensure compliance with this Standard and all legislative requirements;
- sufficient resources are allocated so that the department is compliant with this Standard and legislative requirement by ensuring:
  - that all control measures put in place as part of a risk assessment are implemented completely and they are adhered to by all members of staff;
  - that all members of their department receive appropriate training and supervision;
- all hazardous lasers, including all non-consumer type Class 4 laser devices are appropriately procured through FMS;
- activities involving the use of any source of hazardous light are identified, and that these are suitably risk assessed;
- where Class 3 or 4 lasers are being used, a suitable number of DLPS are appointed. A DLPS is not required in departments only making use of consumer type laser devices;
- suitable processes are in place to ensure that safety equipment supplied for the safe operation of hazardous light sources are routinely tested, and where this is defective, ensure the equipment is quarantined until repaired;
- appropriate emergency plans are established and implemented, and that all those working in their area are aware of these;
- accidents, incidents and near misses involving hazardous light sources are reported to SHaW and are investigated appropriately with preventative / corrective actions taken where required

- the security of the all devices that this Standard applies to is adequate.

### 5.3 Departmental Laser Protection Supervisor

In departments where work is undertaken which involves the use of Class 3 or 4 lasers or any N-CTLD, the HoD is required to appoint a suitable number of persons who will ensure that all laser operations are done in compliance with this Standard.

The DLPS will:

- attend suitable training to gain the skills necessary to fulfil the requirements of the role;
- act as a point of contact for information on the safe use of all Class 3 or 4 lasers within the department;
- assist Line Managers / Principal Investigators / Research Supervisors in completing their risk assessments and safe systems of work;
- maintain a register of all Class 3B or Class 4 lasers or any N-CTLDs;
- ensure that all those working with Class 3B or Class 4 lasers within the department have received appropriate training and are competent to do so;
- ensure that orders or requisitions for all Class 3B or Class 4 lasers and Class 1 N-CTLDs containing a Class 3B or Class 4 laser are done through FMS using the correct purchase code (LS001);
- ensure that, unless there is robust justification why it is not possible, all laser beams are fully enclosed.

### 5.4 University Radiation Protection Officer

The URPO is appointed by the Head of SHaW and is responsible for aiding departments in achieving and maintaining compliance with all legislative requirements by;

- providing competent advice and guidance on the safe use of lasers and laser devices;
- providing advice on the completion of risk assessments for the use of Class 3B, 3R and 4 Lasers;
- acting as a point of contact for externally appointed experts.

### 5.5 Line Manager / Principal Investigator / Academic Supervisor

Responsible on a day-to-day basis for ensuring that risks associated with activities involving artificial optical radiation activities are managed within their area of responsibility. They must ensure:

- a suitable and sufficient risk assessment is completed and reviewed appropriately;
- that all control measures identified in the risk assessments are implemented;
- any persons working within their area of responsibility receive suitable training, and supervision, and they are competent to carry out the work expected of them;
- all devices that are subject to the requirements of this Standard are identified and labelled accordingly;
- the safety of all devices and security of all areas containing devices that this Standard applies to are managed in accordance with the access requirements of this standard;
- no harm comes to themselves or others as a result of their work, actions or inactions.

### 5.6 Hazardous Light workers

All personnel engaged with work activities involving hazardous light are responsible for complying with the arrangements put in place to prevent or reduce exposure. They must:

- be familiar with and understand the risk assessments for their work activities;
- attend all mandatory training as detailed in the risk assessment that has been created for their work, as well as any additional training as required by Line Manager, Principal Investigator or Academic Supervisor or department;
- follow the requirements of all safety documentation developed for the work that they are undertaking;
- wear appropriate personal protective equipment;
- report any incident or accident through the appropriate reporting route;
- report any defective equipment to their line manager;
- attend any relevant training courses;

- ensure that no harm comes to themselves or others as a result of their work, actions or inactions.

### 5.7 All other Workers

Any person(s) who may be affected by a department's use of hazardous light sources must:

- not interfere with any safety signage, equipment or systems installed to ensure the safe use of hazardous light sources;
- report any unsafe conditions appropriately;
- ensure that no harm comes to themselves or others as a result of their work, actions or inactions.

### 5.8 Third Party

Where third parties are making use of anything that would fall within the scope of the matters detailed by this standard, they are asked to inform their hosting department of this use, and where required, too cooperate appropriately.

## 6. MANAGEMENT OF LASER LIGHT SOURCES

### 6.1 Risk Assessment

All uses of lasers or laser devices must be subject to a suitable and sufficient general risk assessment, and all work being done with lasers and lasers devices must be done in accordance with an appropriate System of Work.

Where the work involves the use of Class 3B or 4 lasers or N-CTLD, the risk assessment must be referred to the DLPS for review and approval to ensure that all possible considerations have been made in ensuring that the potential for exposure to a beam is reduced as low as reasonably practicable.

The URPO can be contacted for advice on the use of Class 3R, 3B or 4 lasers or other laser devices if required.

For information on completing a risk assessment see [Guidance Note – Undertaking a Risk Assessment](#).

The risk assessment must take into consideration the class of laser and limits of exposure as detailed below:

#### 6.1.1 Classifying Lasers and Laser Devices

Lasers and laser devices can present a significant risk if uncontrolled. Most significant risks include fire, and damage to a worker's skin or eyes.

Lasers are primarily classified depending on the power of the beam, but other factors are also considered.

The [Information Sheet – Classification of Lasers](#) gives details of the characteristics, power and wavelength limits for a given laser class.

#### 6.1.2 Limits of Exposure

Various exposure limits apply to laser beams, and these are dependent on a number of factors, such as the wavelength, power and the size of the beam.

##### Accessible Emission Limits

Work activities must not expose anyone to laser radiation in excess of the AEL of a Class 2 Laser (see section 6.2). Control measures in the risk assessment for such work activities must eliminate the risk of any such exposure.

Any work that cannot meet this requirement must be referred the URPO for additional comment.

##### Maximum Permissible Exposures

Work activities must not expose anyone to laser radiation in excess of the MPE for the laser or laser device. Work must not commence if there is a reasonably foreseeable risk of

potential exposure to a laser (either by direct viewing or by reflected light) in excess of the MPE.

## 6.2 Information, Instruction, Training and Supervision

### 6.2.1 Training

All persons who could potentially be exposed to a laser on University property or as a result of University work must be provided with sufficient information, instruction, training and supervision to ensure that they are aware of all the risks that a laser may present, and what measures should in place to control this risk.

All those involved in work with lasers must be provided, as a minimum, with the following information:

- The significant findings of any applicable risk assessments;
- The risks to health from any exposures;
- The control measures in place;
- Emergency procedures in place.

All laser workers must complete the mandatory [University Basic Safety Induction for the use of laser light sources](#) prior to work commencing.

Once complete, all workers must ensure they complete any other training required by the department to demonstrate compliance before commencing work.

Training must be refreshed every 3 years.

Further Information: [Information Sheet - Artificial Optical Radiation Training](#).

### 6.2.2 Competency Requirements

It is the department's responsibility to ensure that any person working with a hazardous laser or a N-CTLD is competent to do so.

Departments are required to ensure that all those working with hazardous light undergo specific training to ensure that they are competent to work with these devices safely. This training should include, but is not limited to, the following:

- Departmental procedures and protocols
- Practical skills training
- Emergency procedures

Training should be recorded on the [Artificial Optical Radiation Training and Competence Record](#). This record should be completed for each worker, and a copy of to be kept by both the department and the worker.

Where the training is carried out locally by the department, the department must ensure that this is delivered by a person competent to do so.

Further Information: Induction, Training and Competence Standard (**currently under development**).

## 6.3 Procurement of Hazardous Lasers and Laser Devices

All lasers (including any components such as diodes used to assemble lasers) or laser devices must be purchased from a reputable supplier. This would be a supplier who is able to prove that the laser, laser device or components being supplied comply with the relevant British Standard, BS EN 60825-1:2014.

All purchases of Class 3B or Class 4 lasers and Class 1 N-CTLDs containing a Class 3B or Class 4 laser must be done through FMS using the correct purchase code (LS001). All purchases made using this code will be reviewed by the URPO.

Where a laser-based device (for example, a laser printer) contains a Class 4 laser, but in all reasonable use, a user could not be exposed, the purchasing code above does not need to be used.

Any queries on whether a device should be purchased using the code, or where there is any doubt over the supplier to be used, assistance must be sought from the URPO.



## 6.4 Inventory of Lasers and Laser Devices

Departments must maintain a suitable inventory of all lasers or N-CTLD. The inventory is essential in the event of emergencies.

Whenever any of the following devices are purchased, then the purchase must be recorded, and the laser or device must be added to the inventory:

- Class 4 Laser;
- Any non-consumer type laser device containing a 4 Laser.

Records are maintained through the [eRad](#) system. Departments may use this, or they can create their own inventory.

## 6.5 Maintenance and Testing of Lasers Safety Equipment

Depending on their classification, lasers and laser devices may require specific additional equipment or systems installed to ensure the safety of those using them.

These systems must be routinely tested and maintained. Where any system fails testing, the device must be placed out of use and repaired by a suitably competent person

HoDs are responsible for ensuring that testing is done, and that a suitable record is kept of all maintenance and testing conducted.

Further information can be found in the [Guidance Note – Safe Use of Lasers](#).

## 6.6 Laser Pointers

Departments may purchase Class 1 or Class 2 laser pointers, provided that it is purchased from reputable suppliers / manufacturers (see Section 7.5). There are no absolute limits on the number of devices that a department may hold, but a suitable and sufficient risk assessment is created to ensure the safe use of these devices.

Due to lack of regulation on the import on laser devices, it is currently possible to purchase devices with a power level that would place a small laser device into higher classifications, such as 3R or 4 despite the device being labelled as Class 1 or Class 2.

If there is any doubt regarding the power or classification of a laser pointer, it must not be used and must be sent to the URPO. If deemed appropriate, the device will be returned, but if there is any issue with the device, it will be disposed of centrally by the URPO.

## 6.7 Emergency planning and accident/incident reporting

When using lasers or laser devices, there is the potential for significant injury or incident to occur.

Departments are required to prepare suitable emergency plans to ensure that any reasonably foreseeable incident can be managed appropriately.

### 6.7.1 Incidents Involving Lasers

All emergency plans must be reviewed by the Department Health, Safety and Wellbeing Committee. Emergency response plans must be practiced to ensure that all personnel are aware of the actions required in the event of an accident or incident.

All incidents involving lasers must be reported using the SIRIS system.

### 6.7.2 Laser Eye Strike

Any instance of a laser eye strike must be treated as a medical emergency, regardless of severity of symptoms, including in the event of lack of symptoms.

Any person who suffers a laser eye strike, whether in the form of a direct exposure to the beam, or through reflection must immediately attend the nearest emergency department. An optician will not be able to provide any treatment for injuries sustained from a laser eye strike.

In all areas where Class 3 or 4 lasers are in use, then departments must ensure that a laser hazard information card is available. This card must detail the specifics of the laser to which it applies so that, in the event of a laser eye strike, information is immediately available and can be taken with the injured party.

Information on responding to a laser eye strike can be found in the [Information Sheet – Laser Incident Response](#).

### 6.7.3 Malicious Use of Lasers or Laser devices

Even low power laser devices have the potential to cause harm to anyone that is exposed to them. All incidents or accidents involving lasers must be reported using the SIRIS system.

Anyone found to be misusing a laser or laser device on University property must be reported to their line manager and the URPO immediately.

If a laser is deliberately pointed at another person, then the person wielding the laser will be subject to departmental and/or University investigation and possible disciplinary procedures and, depending upon the severity of the incident, may be reported to the local police.

## 6.8 Safe Use of Lasers and Laser Devices

Departments must ensure that they take all appropriate steps to prevent harm from the use of all lasers.

For further Information on facilities design and the control of laser light sources see [Guidance Notes on the Safe Use of Lasers and Laser Devices](#).

- **Designations of Laser Areas** - Any area where a laser is in use must be identified and appropriately designated and recorded in the department's local safety management arrangements.
- **Design of Laser Areas** - When planning work with lasers, then the overall design of the area in which they will be used must be considered.
- **Hazard Warning Signs for Lasers and Laser Devices** - All lasers, laser devices and areas where hazardous lasers are in use must be marked to indicate the presence of the laser. The specific markings that each laser and laser area must carry the classification or designation. Further Information laser area warning signage can be found in the [Guidance Note – Safe use of Lasers](#), and the requirements of labelling of lasers can be found in [Information Sheet - Labelling of Lasers and Laser Devices](#).
- **Experiment Layout** – The experimental layout in an LCA must be designed to minimise the risk of any injuries caused by the laser, and maximise the ergonomics of the area, increasing the likelihood that the controls in place will be used appropriately.
- **Engineered Controls** - All steps must be taken to prevent access to any laser radiation in excess of the Accessible Emission Limit of a Class 2 Laser (1mW). Engineering controls provide automatic or passive protection from the beam that require no or limited human intervention to ensure they function, provided that they are used properly.
- **Personal Protective Equipment** - All other risk control measures must be considered before PPE. PPE must only be considered where the risk assessment does not identify controls which are capable of completely controlling the risk. The main aim of using PPE is to prevent the exposure of the skin or eyes to the laser beam.

## 7. MANAGEMENT OF NON-COHERENT LIGHT SOURCES

### 7.1 Non-Coherent Light Sources Risk Assessments

All uses of non-coherent light sources must be subject to a suitable and sufficient general risk assessment, to ensure that any risk of adverse health effects caused by exposure to non-coherent light sources are eliminated, and where this is not possible, reduced to as low a level as reasonably practicable. Control measures may include for example the use of guarding, access controls and PPE.

For information on completing a risk assessment see [Guidance Note – Undertaking a Risk Assessment](#).

### 7.2 Types of Non-Coherent Light Sources

#### 7.2.1 Ultraviolet Light

UV light has a wavelength of between 100 and 400nm, so it sits outside the visible spectrum.

UV light has a number of applications, and can be found in a number of areas throughout the University, including:



- Bactericidal lamps;
- Black light lamps;
- Fluorescence equipment;
- Curing lamps.

This list is not exhaustive. Any light source emitting light in this range of wavelengths must be subject to the controls stated in this Standard.

UV light has the potential to damage both the skin and eyes of anyone exposed to the source. Effects on the skin can include erythema (redness), burns and exposure is linked to an increased likelihood of developing cancers. Effects on the eyes includes the development of conjunctivitis or photokeratitis (inflammation of the cornea of the eye).

Damage from UV depends on both the length of exposure and strength of the emission, with a frequent, low level exposure being potentially as damaging as a short, high-level exposure.

### 7.2.2 Infrared Light

IR light is light has a wavelength between 700nm and 1mm, so similar to UV, it sits outside the visible spectrum.

IR light has a number of applications, and can be found in a number of pieces of equipment, such as:

- Heat lamps;
- IR Illuminators.

IR radiation has the potential to damage the skin and eyes of anyone exposed to the source. Effects on the skin can include erythema (redness), irritation and burns, with long term exposure leading to significant harm. The damage caused depends on both the length of exposure as well as the strength of exposure.

### 7.2.3 Other Sources of Artificial Optical Radiation

All other sources of artificial optical radiation, whether visible or invisible, must be subject to a suitable and sufficient risk assessment which includes the risks presented by the optical component created by the equipment.

## 7.3 Information, Instruction, Training and Supervision

Workers planning to work with non-coherent forms of hazardous light must receive suitable training and information to ensure they do so safely. Further Information: [Information Sheet - Artificial Optical Radiation Training](#).

### 7.3.1 Training

Given the variety of potential sources and applications of these sources, it is not practical to cover all the potential safety implications in a simple online course.

To ensure that all users of these sources are kept safe from any potential harm, departments are required to ensure the risks of potential exposures to the source of hazardous light is assessed and that all work involving these devices are covered by a suitable and sufficient general risk assessment using the [eRisk system](#), with the significant findings from the risk assessment being communicated to those who are working with the light source.

### 7.3.2 Competency

All hazardous light workers must be competent to carry out relevant activities. It is the responsibility of the Line Manager/Principal Investigator or Academic Supervisor to determine the competence of those who they are responsible for managing. For details on assessing competence refer to the Information: Induction, Training and Competence Standard (**currently under development**).

## 7.4 Maintenance and testing of non-coherent light source safety equipment

Non-coherent light sources may have equipment or systems installed to ensure the safety of those using them, by preventing access to the light whilst the device is in operation.

These systems must be routinely tested and maintained to ensure that they will perform their function. Where any system fails testing, the device must be placed out of use and repaired by a suitably competent person.

HoDs are responsible for ensuring that testing is done, and that a suitable record is kept of all maintenance and testing conducted.

## 7.5 Procurement of Non-Coherent Light Sources

All sources of UV or IR light must be purchased from a reputable supplier. Where there is any doubt over whether a purchase should be made from a particular supplier, assistance should be sought from the URPO.

## 7.6 Safe Use of Non-Coherent Light Sources

### 7.6.1 Labelling of Non-Coherent Light Sources

All sources of hazardous non-coherent light must be marked to indicate the presence of a hazardous light source. The specific markings will depend on the light being emitted.

The standard marking is the non-ionising radiation symbol with wording indicating the form of the light being generated:



**Non-ionising radiation**

This symbol must be displayed on all UV or IR light sources in a prominent position. All access panels must bear the same warning markings if the panel can be opened and expose the person opening the panel to the light source.

### 7.6.2 Personal Protective Equipment

PPE must be the last risk control measure to be considered. PPE does not eliminate or control the hazard at source and persons are still potentially able to expose themselves to the hazardous light.

The use of appropriate PPE must be identified during the risk assessment process. It should be noted however that the use of goggles must be considered only when every other possible avenue to removing or reducing the risk has been considered.

#### **PPE for Ultraviolet light**

Ultraviolet light presents a significant risk to the health of a worker. This light source can affect both the skin and eyes of any exposed to it.

Extended UV exposure can lead to:

- Burns to the skin (sun burn like injuries);
- Retinal / Macular damage;
- Photokeratitis;
- Cataracts;
- Increased risk of skin cancer.

When working with UV light, workers must ensure that they protect themselves from any possible exposure.

PPE for UV sources include:

- Barrier creams;

- Long sleeved lab coats;
- Gloves;
- Suitable Goggles.

### **PPE for Infrared Light**

Similarly, to UV light, IR light can present a significant hazard to a worker's health. The effects of exposure to IR light can be split into thermal and non-thermal effects.

The thermal effects can give rise to heating of bodily tissues, leading to localised burns of the skin or other exposed tissues.

The non-thermal effects can include:

- Photokeratitis;
- Retinal damage.

When working with IR light, workers must ensure that they protect themselves from any possible exposures.

PPE for use with IR light sources include:

- Long sleeved lab coats;
- Gloves;
- Suitable goggles.

## **8. ACCESS TO HAZARDOUS LIGHT FACILITIES**

Any area that hazardous light sources are used in must be identified and appropriately designated. Certain areas that contain hazardous light sources will require specific controls to be in place and may have controls in place to restrict access.

### **8.1 Authorised Personnel**

Where hazardous light sources are in use, departments must ensure that only authorised personnel are permitted access. The means to permit access to only authorised personnel will be determined by the hazard presented by the light source.

Section 6.5.2 of Guidance Note – Safe use of Lasers and Laser Devices gives information on various administrative and physical controls which can be put in place to prevent access by unauthorised personnel.

Further Information: [Guidance Note – Safe Use of Lasers and Laser Devices](#).

### **8.2 Estates Personnel**

During routine and emergency facilities work, Estates Services personnel, may need to enter areas where sources of hazardous light are present.

Where this work is planned, those responsible for the sources must be notified so that the sources can be made safe for the duration of the work. Estates Services workers must not enter an area where any hazardous light is currently in operation, and they must not allow any other person to enter such an area without first consulting the area safety contact.

Estates Services personnel attending an emergency in an area where a hazardous light source is present, may enter the area, on approval from the person responsible from the area or equipment. If the area safety contact is unavailable, assistance must be sought from the URPO before making entry.

### **8.3 Security Services Personnel**

Security Services personnel may have a need to enter areas where sources of hazardous light are present in an emergency.

Where security require to enter such an area, they must ensure that they only do so once information on the sources present within the area has been gained from the person responsible from the area or equipment. If the area safety contact is unavailable, assistance must be sought from the URPO before making any entry.

There are no foreseeable circumstances where Security Services personnel will require routine access to an area where hazardous light sources are in operation and they must not access, or allow any other personnel to access, an area where hazardous light sources are in operation without first speaking with the area safety contact or the URPO.

## **9. DISPOSAL OF HAZARDOUS LIGHT SOURCES**

When a hazardous light source has reached the end of its life, the device must be disposed of correctly.

Initially, consideration must be given to reusing the device within the University. Departments who wish to dispose of a functioning hazardous light source are encouraged to make the device available to other users in the first instance.

Where ownership of the device is transferred to another department, the receiving department must ensure that a suitable and sufficient risk assessment is completed.

If there is no further use within the University, or the device is non-functional, Estates Services provide a Waste Electrical and Electronic Equipment (WEEE) disposal service. Information can be found on the [Estates Services Website](#).

### **9.1 Solid-State Devices**

Devices of a solid-state construction (including laser diodes and other such devices) must be disposed of via the University WEEE disposal route, managed by Estates Services.

The device must be rendered non-functioning before it is sent to Estates Services for disposal. The term non-functioning would vary device by device, but at a minimum, the arming keys must be disposed of separately and any plugs must be removed.

### **9.2 Non-Solid-State Devices**

Prior to disposing of a non-solid-state device, the owner may be required to remove the lamp from the device before Estates Services will accept the device.

The Line Manager, Principal Investigator or Academic Supervisor must ensure that a risk assessment has been completed for removing and disposing of the medium.

Where there is any concern regarding the removal of the lamp, the Line Manager, Principal Investigator or Academic Supervisor must contact SHaW for advice on the potential hazards associated with the material.

Once the lamp has been safely removed, it can then be disposed of through normal departmental routes for the particular material and the remaining equipment must be disposed of as normal electronic waste through the University WEEE disposal service, run by Estates Services.

## **10. PERFORMANCE MONITORING**

To ensure that departments are compliant with CAORW10 and University requirements, all departments that use hazardous light sources will be subject to audits by various parties from the University.

### **10.1 Compliance Audits**

The purpose of these visits is to ensure that departments are maintaining a suitable level of control over the hazards presented by hazardous light sources, and to provide guidance where it is deemed necessary to ensure compliance.

### **10.2 Regulatory Visits**

Given the potential for injury from the use of hazardous light sources, external regulatory bodies may request to visit the University to carry out inspections of departments making use of such sources.

Should there be any need for regulatory bodies to visit the University, this will be coordinated through SHaW by the URPO.

## 11. DOCUMENTATION AND RECORDS

The requirements to meet the standard for the safe management of Artificial Optical Radiation are described in this document. Some aspects are covered in more detail in other documents which are referenced throughout.

Written records to be maintained to comply with this Standard are:

- Purchase records;
- Inventory of devices;
- Suitable risk assessments;
- Maintenance and testing records.

## 12. COMMUNICATION AND REPORTING

12.1 A copy of the latest Standard will be available on the SHaW website, [here](#).

12.2 Departments are expected to report on compliance with this Standard as part of regular OHS performance monitoring. Further information can be obtained from SHaW

12.3 With regard to this Standard, departments must report incidents associated with Hazardous Light to the DSC immediately. If appropriate a report must be made using the SIRIS system. If more than one person is involved in an incident, then a separate report should be completed for each individual involved.

12.4 Some incidents may be reportable under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). These regulations require that certain work-related injuries, cases of ill health and dangerous occurrences be reported to the Health and Safety Executive (HSE). SHaW manage the reporting of incidents under RIDDOR.

## 13. TOOLS

### Forms

- Hazardous Light Worker Training and Competence Record

### Guidance Notes

- Guidance Note – Safe use of Lasers and laser Devices

### Information Sheets

- Information Sheet – Laser Warning Signs and Labelling Requirements
- Information Sheet – Laser Incident Response
- Information Sheet – Laser Classifications
- Information Sheet – AOR Training Information

## 14. COMPLIANCE

This standard aims to meet the requirements of:

- Health and Safety at Work etc. Act (1974).
- Management of Health and Safety at Work Regulations (1999) .
- Control of Artificial Optical Radiation at Work Regulations (2010)
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013).
- Provision of Personal Protective Equipment Regulations (1992).
- Provision and Use of Work Equipment Regulations (1998).
- Managing for Health and Safety HSG65 (2013).
- USHA Leadership and Management in Health and Safety in Higher Education Institutions (2015).
- USHA Health and Safety Management Profile (HASMAPP) (2015)
- Association of University Radiation Protection Officers Safe Use of Lasers in Education and Research
- BS EN:60825-1:2014 – Safety of Laser Products

## 15. DOCUMENT HISTORY

A record of changes to this document are maintained in the SHaW Document Control Register.