

Laser Safety Arrangements

University of Aberdeen

Version 2
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Arrangements for the use of laser equipment in University of Aberdeen

The University's overall arrangements for health and safety are set out in the University's health and Safety Policy. This document outlines the arrangements for safety in the use of lasers.

The University of Aberdeen (UOA) has appointed a **Laser Protection Adviser (LPA)** to advise on laser safety. The LPA is provided by the NHS Grampian Radiation Protection Service under contract. In particular the LPA will advise on the introduction of new lasers and on plans for new facilities. The LPA will carry out regular audits of laser safety arrangements in existing facilities and provide advice and assistance in the provision of safety information and training

1. New installations and any modifications to current equipment (applicable only to class 3B or 4 laser systems)

The Laser Protection Adviser (LPA) must be informed of any planned introduction of class 3B or 4 lasers or change of use, for both trial use and purchase, so that an appropriate risk assessment can be made and hazards identified before the intended use commences. Exposure to these lasers are particularly hazardous and can result in eye injury or even blindness. The LPA must be informed of any modifications or upgrading of current laser equipment. In this case, the laser must be tested for laser safety before the device is put into use.

The Laser Protection Adviser, must be satisfied with safety arrangements, and is consulted for the appointment of an appropriate Laser Protection Supervisor for each laser facility.

2. Risk Management

A documented risk assessment must be carried for all uses of class 3B and 4 lasers.

The risk assessment must consider:-

Optical hazard and suitable protective eye wear

Exposure Limit values (ELV)

Skin hazard and suitable protective clothing

Fire hazard

Electrical hazards

Training requirements

Reasonably foreseeable incident scenarios

Suitable contingency plans

Safe working procedures

Establishment of laser controlled area

Use of barriers as control measure

The risk assessment should be completed by the LPS in conjunction with authorised users but must be reviewed and approved by the LPA. The LPS, in conjunction with the Authorised User(s), should review the risk assessment on a routine basis to assess the effectiveness of the control measures in place.

3. Laser Protection Supervisor (LPS)

For each laser facility where Class 3 or Class 4 lasers are used, a Laser Protection Supervisor must be appointed. The appointment must be confirmed in writing. The LPSs

are responsible for ensuring local rules are followed. They must bring the local rules and relevant operating procedures to the attention of all staff affected by them. A system should be in place so that the LPS is aware of any planned introduction of class 3B or class 4 lasers including loan lasers, prior to them arriving on the premises. The LPS should seek advice from the LPA regarding any safety concerns. The LPS MUST inform the University Safety Advisor if they leave their current job and another LPS will then be appointed in writing.

4. Personal protective Equipment (PPE)

Laser safety eyewear should be used if it is not reasonably practicable to fully enclose the lasers and there is a risk of user being exposed to the beam. Protective eyewear should be appropriate for the power and wavelength of the laser. These should be clearly labelled and in good condition (i.e. no scratches or cracks). When PPE is required then it must be worn.

In unusual operating requirements, if the use of protective eyewear is not practicable for visible lasers and use of alignment goggles is required instead of protective goggles then the risk assessment must be carried out by the LPS and approved by the LPA before starting such work.

5. Local Rules

Local rules are required to be written and followed for each laser controlled area where Class 3 or Class 4 lasers are used. The local rules must contain

- * Identification and description of the laser controlled areas
- * Names of the LPS and LPA with contact details
- * Register of authorised personnel intending to work with Class 3 or Class 4 lasers
- * Details of personal protective equipment
- * Quality assurance checks
- * Method of safe working
- * Adverse incident procedure
- * Laser equipment and controlled area handover procedure for service or calibration

6. Authorised users

The use of Class 3 or Class 4 lasers for research and teaching is restricted to authorised users. All authorised users should sign a register (as part of local rules) to indicate that they understand and accept the local rules. All authorised users should adhere to all appropriate safety measures, including the local rules.

7. Research Lasers

All work involving hazardous lasers must first be risk assessed and where appropriate by written safety procedures put in place. The relevant manager should also ensure that their laser workers are effectively trained in the operating techniques and safety procedures and that inexperienced staff are adequately supervised.

8. Lasers used for teaching

If a Class 3 or Class 4 laser is used for teaching purposes, appropriate risk assessment should be carried out and it must be ensured that the students are protected. Students should follow safe working procedures.

9. Training

9.1. Equipment Training

The manufacturer or their supplier usually provides the equipment based training to the authorised users at the time of installation. Training can also be provided by a suitably trained laser user. No Authorised User will be added to the list in the Local Rules until their training has been verified.

9.2. Safety Training

All laser users intending to work with Class 3R, Class 3B and Class 4 lasers, and others who may be working with modified Class 1M or Class 2M devices, will need to be identified and receive training in the safe use of lasers. The LPS should have a documented evidence of staff training.

9.3. Reporting and investigation of incidents

All incidents involving laser use will be reported through the University's system for reporting accidents and near misses as described at <http://www.abdn.ac.uk/safety/general/accidents>

The University Safety Adviser and LPA will investigate incidents, and report those to the radiation safety committee or any other governing bodies as required.

9.4. Safety Auditing

The Radiation Protection Service will audit the safety arrangements in each area using lasers on an annual basis. Reports on the audit findings will be made available to the University's Radiation Hazards Sub Committee.

10. Servicing and Calibration

The University of Aberdeen has many **Class 1** or class 2 lasers in use. These lasers are considered safe under reasonably foreseeable conditions of operation, either because of the inherently low emission of the laser itself or because of its engineering design such that it is totally enclosed and human access to higher levels is not possible under normal operation. If access panels of a totally enclosed system are removed for servicing or calibration, then the laser product is **no longer Class 1** or class 2 and the precautions applicable to the embedded laser (which can be a class 3B or 4 laser) must be applied until the panels are replaced. During servicing and calibration the controlled area and equipment must be handed over to the service engineer. In this situation the engineer is responsible for ensuring the safety of staff, equipment and controlled area.

Version history

Version	Date	Changes
V1.2	November 2008	First issue
V1.3	April 2013	Reviewed by Radiation Hazards Sub Committee. Minor Changes to clarify that LPS, local rules and authorised users are required where Class 3 and Class 4 lasers are used.
V2	Feb 2020	Reviewed by Radiation Hazards Sub Committee. Minor changes to clarify LPA role. Addition of Risk management and personal protective equipment sections. Minor changes to servicing and calibration section ,