



# Management of Class 3B and 4 Lasers

Guidance for Heads of School/ Service

PRSG14.2: WELLBEING, SAFETY AND HEALTH MANAGEMENT SYSTEM							
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## 1. Introduction

This guidance gives background information to Heads of School/ Service whose remit covers people working with lasers. Questions should be directed to Ian Haslam or Andrew Cowling (Radiation Protection Service) on [radiation@leeds.ac.uk](mailto:radiation@leeds.ac.uk) or by telephone on 0113 34 34203. More information is at [www.leeds.ac.uk/rps](http://www.leeds.ac.uk/rps)

## 2. Definitions

**Class 3B and 4 lasers** are high power lasers with such potential to cause harm that they need to be carefully controlled. Intrabeam viewing of these lasers will always cause serious retinal and skin damage, and even reflections may cause harm. Examples include machining, ablation, Particle Image Velocimetry and open beam Raman spectroscopy.

They do not include Class 1, 2, 3A and 3R lasers (low power lasers like confocal microscopes, CD-ROM drives, laser printers, surveying equipment) which, if used under normal operational conditions and without modification (e.g. using lenses to focus beam,) are considered to pose a low or negligible risk.

**VIRGIL database** – the University's laser database on which all 3B and 4 lasers must be registered and risk assessments recorded.

More information and definitions are available at [www.leeds.ac.uk/rps](http://www.leeds.ac.uk/rps)

## 3. Roles and actions

The health and safety responsibilities of staff, students or visiting personnel are set out in the University Health and Safety Policy (<http://www.leeds.ac.uk/safety/policy.htm>). For the management of lasers, the identified role-holders should carry out the additional specific actions listed below.

### Radiation Protection Service (Qualified experts)

- Qualified Experts is a particular legal term for specific roles at the University. The University has appointed Ian Haslam (x34203; [i.k.haslam@leeds.ac.uk](mailto:i.k.haslam@leeds.ac.uk)) and Andrew Cowling (x34202; [a.cowling@leeds.ac.uk](mailto:a.cowling@leeds.ac.uk)) of the **Radiation Protection Service** as its sole Qualified Experts.
- Further information: <http://www.leeds.ac.uk/rps/people.html>.

### Head of School/ Service

- Identify and appoint a Laser Safety Officer (LSO). Both the Dean and Radiation Protection Service will provide direction to help you make this decision.
- Further information: <http://www.leeds.ac.uk/rps/lasers/hos.html>.

**Laser Safety Officer (LSO)** (*an experienced laser user, who by virtue of the nature of their research activities may be a member of the academic or technical staff; sometimes called a 'competent person'*).

- Ensure that the work is carried according to the requirements of the Laser Standard Operating Procedure (LSOP) and any local procedures that might apply.
- Give approval for the acquisition of a Class 3B or 4 laser.
- *The following roles are usually carried out by the LSO but may be delegated to a nominee* - Enter level 3 training information for laser users and approved information about Class 3B or 4 laser onto VIRGIL, support risk assessments
- Further information: <http://www.leeds.ac.uk/rps/lasers/hos.html>.

### Laser user

- Get written permission from your Laser Safety Officer before acquiring or purchasing a Class 3B or 4 laser.
- Follow any Laser Standard Operating Procedures (including VIRGIL) required.
- Comply with requirements identified in the training matrix.

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## Guidance

### 4. Classification of lasers

- All lasers should come with a label categorizing them into a class. If a laser is not clearly classified (as often happens with lasers brought in from outside the European Union), please speak to the Laser Safety Officer (LSO) to confirm its class.
- Class 3B and 4 lasers need to be registered on the VIRGIL system. Speak to your LSO or the Radiation Protection Service if you have any questions.

### 5. 'Laser Standard Operating Procedure'

- There is a centrally prepared Laser SOP for work with lasers (<http://www.leeds.ac.uk/rps/lasers/instructions.html>). This specifies the stages that must be followed when designing and running laser experiments.
- Research groups should prepare local written instructions to control Level 3 (high risk) hazards if risk assessments indicate the need.
- Class 1, 2, 3A and 3R lasers pose low or negligible risk and therefore, to support local management, simple guidance has been produced (<http://www.leeds.ac.uk/rps/lasers/instructions.html>).

### 6. Audits and inspections

- The Radiation Protection Service undertakes annual inspections of all areas used for handling Class 3B and 4 lasers.
- Laser facilities and management will be included in the overarching HASMAP audits carried out by Health and Safety Services, and the Radiation Protection Service is included in this.

### 7. Accident reporting

- What constitutes a reportable accident, incident or near miss in relation to lasers is defined in the Laser SOP.
- If it is reportable, Sentinel (the University's online accident and incident reporting system) should be used through local processes. Local staff (often Health and Safety Coordinators) can upload information. Speak to your Health and Safety Manager if you have any questions.

### 8. Training

- Training for lasers is set out in the Training Matrix (<http://www.leeds.ac.uk/rps/ionising/docs/trainingmatrix.pdf>).
- Training for new laser users comprises local induction and centrally provided web based or face to face depending on user preference / needs.
- Training is recorded on the laser database and is part of the application process (VIRGIL; <http://rsid.leeds.ac.uk/lasers>).
- Where training is provided centrally the Radiation Protection Service will enter it onto SAP.
- Where training is provided locally (as defined in the protocol on 'Health and safety training and competences') it is entered by the LSO or nominated person onto the VIRGIL database which is considered as the local database.

### 9. Statutory records

- Records are kept by the Radiation Protection Service

### 10. Laser facilities

The process for refurbishing or building new laser facilities is complex, not only with respect to meeting the expectations of the client, but also in complying with the additional statutory requirements that apply to many specialist facilities.

Before going ahead with refurbishment or new builds, or before first use of new Class 3B or 4 laser facilities, the Radiation Protection Service must give written permission. As part of this:

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- The Head of Radiation Protection must be consulted at least at RIBA (Royal Institute of British Architects) planning stages B, D, and E. No changes to any aspects of design or installation can be made once stage E has passed without approval from the Head of Radiation Protection.
- A critical examination will also be carried out by the Radiation Protection Service, on all facilities, be they buildings, rooms or equipment, before they are commissioned into use.

### 11. Authorising the acquisition of lasers

- There are many ways in which staff acquire lasers for the University – e.g. as brand new purchases, gifts from other Universities, second hand purchases, loans from old colleagues.
- The written permission of the LSO must be obtained prior to any Class 3B or 4 laser being brought on to University premises. Permission can be by email.
- If staff acquire the laser and it has no CE marking (as often happens if it is bought from outside the European Union) they should discuss this with their Laser Safety Officer.

### 12. Laser database - VIRGIL

- VIRGIL is the University's laser database on which all 3B and 4 lasers must be registered and risk assessments recorded.
- The purpose of VIRGIL is to be the gatekeeper and manager or the University's duty of care arrangements for Class 3B and 4 lasers.
- It is essential that laser users know how to use VIRGIL properly and do so. This will then ensure that the school/ service is compliant with both University requirements and legislation.
- If you are in any way unsure about any aspect of VIRGIL, do not proceed, but contact the Radiation Protection Service directly. VIRGIL covers all processes from application for permits, risk assessment, laser register, through to training.
- If the VIRGIL database is not available (e.g. due to a power outage or computer failure) contact the Radiation Protection Service on to get written authorisation before proceeding.

### 13. Access control arrangements

- Only people who hold a laser work authorisation or are otherwise authorised by the Lab Manager or equivalent should be allowed into laser facilities.
- Laser facilities for Class 3B and 4 lasers must be secured - ideally by a Simons Voss system or similarly stringent method.

### 14. Signage

- Only facilities holding Class 3B or 4 lasers should have laser hazard warning signs mounted on access doors.
- Signage needs to be issued/ authorised by the Radiation Protection Service.

### 15. Local procedures

- Centrally produced SOPs relate to all Class 3B and 4 laser facilities. In addition, some activities present a higher risk that will require managing by locally produced procedures. VIRGIL will indicate where this is necessary.

### 16. Support and Guidance

Any questions should be directed to Ian Haslam or Andrew Cowling of the Radiation Protection Service (Qualified Experts) on [radiation@leeds.ac.uk](mailto:radiation@leeds.ac.uk) or by telephone on 0113 34 34203. More information is also available at [www.leeds.ac.uk/rps](http://www.leeds.ac.uk/rps)

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