





# HEALTH AND SAFETY SERVICES

## WELLBEING, SAFETY AND HEALTH


**UNIVERSITY OF LEEDS**

### LOCAL RULES FOR THE USE OF X-RAY EQUIPMENT

#### 1. PURPOSE

The purpose of these local rules is to set out the key arrangements for restricting exposure to ionising radiation from work with x-ray equipment in the named research group.

The Local Rules have been written in compliance with regulation 18 of the Ionising Radiations Regulations 2017.

#### 2. GROUP AND PERSONNEL

|  |                                 |            |
|--|---------------------------------|------------|
| <b>Research Group</b>                                |                                 |            |
| <b>Radiation Protection Supervisor (RPS)</b>         |                                 | Tel:       |
| <b>TLD Distributor</b>                               |                                 | Tel:       |
| <b>Radiation Safety Coordinator (RSC)</b>            |                                 | Tel:       |
| <b>University Radiation Protection Manager (RPM)</b> | Andrew Cowling                  | Tel: 34202 |
| <b>University Radiation Protection Adviser (RPA)</b> | Mark Bescoby, Radman Associates |            |

**3. REGISTERED RADIATION AREAS**

| Lab/Area | Description | Designation |
|----------|-------------|-------------|
|          |             |             |
|          |             |             |

**4. AUTHORISED X-RAY EQUIPMENT**

| Manufacturer | XRID | Type/Serial | Description |
|--------------|------|-------------|-------------|
|              |      |             |             |
|              |      |             |             |

## 5. MANAGEMENT OF RADIATION WORK

The university's management arrangements for work with ionising radiation are detailed in the following three documents:

- University of Leeds Health and Safety Policy at [http://wsh.leeds.ac.uk/info/137/health\\_and\\_safety\\_policy/125/health\\_and\\_safety\\_policy](http://wsh.leeds.ac.uk/info/137/health_and_safety_policy/125/health_and_safety_policy).
- University of Leeds Health and Safety Standard: Management of Sources of Ionising Radiation (and accompanying guidance) at <http://wsh.leeds.ac.uk/download/downloads/id/122/Ionising%20Radiation%20Standard>
- University of Leeds Radiation Governance Arrangements at <http://wsh.leeds.ac.uk/download/downloads/id/498/Radiation%20Governance%20Statement>.

The persons named in section 2 of these rules are responsible for the management and supervision of radiation work in the group as specified in these documents.

## 6. TRAINING AND RADIATION WORK AUTHORISATION

Only authorised persons are permitted to use x-ray equipment.

The authorisation procedures ensure that the person has received sufficient information, instruction and training for the radiation work they will be undertaking.

Persons using x-ray systems should complete local induction training and any further training and authorisation procedures specific to the equipment (detailed in section 13). The RPS or RSC will authorise their use of the equipment when they are satisfied that sufficient training has been completed.

A list of authorised x-ray users for this group is at Appendix 1.

## 7. RISK ASSESSMENT

Risk assessments for x-ray equipment can be found at [http://wsh.leeds.ac.uk/info/214/ionising\\_radiation/82/x-rays](http://wsh.leeds.ac.uk/info/214/ionising_radiation/82/x-rays). The control measures required to address the hazards identified in the risk assessments are detailed in these local rules.

## 8. PRIOR AUTHORISATION AND CRITICAL EXAMINATION

All x-ray equipment must have adequate shielding, exposure controls, safety devices and warning devices compliant with regulation 9 of IRR17.

All x-ray equipment must be subject to a 'Critical Examination' by the installer that ensures that safety features and warning devices operate correctly and that there is sufficient protection for persons from exposure to radiation.

The RPM will undertake a further critical examination before first use and annually thereafter to

confirm that the equipment complies with the prior authorisation and that the safety features, warning devices and exposure protection are satisfactory.

A further critical examination by the RPM will be required if the equipment is repaired, moved, or altered significantly.

## 9. RADIATION AREA CATEGORIES AND ACCESS RESTRICTIONS

X-ray equipment must only be used in secure locations, i.e. in rooms protected by Simons-Voss transponders (or equivalent), to which only persons authorised by the RPS have access. Each radiation area must be registered with the RPM and is categorised based on the level of risk and access restriction required. The categories are:

|   |  |
|---|--|
| <b>Controlled Area</b><br><b>(Highly restricted access)</b> | Access is restricted to authorised radiation workers operating under a specific written system of work for this area.<br><br>A local access permit is required for service engineers, maintenance contractors, visitors, etc. to enter these areas (issued by RPS or RSC). |
| <b>Supervised Area</b><br><b>(Restricted access)</b>        | Access is restricted to authorised radiation workers.<br><br>A local access permit is required for service engineers, maintenance contractors, visitors, etc. to enter these areas (issued by RPS or RSC).   |
| <b>Undesignated Area</b><br><b>(Limited access)</b>         | Access to these areas is not restricted.<br><br>All work areas, samples and equipment should be clearly labelled.  |

## 10. DOSE LIMITS, PERSONAL DOSIMETRY AND DOSE INVESTIGATION LEVELS

### ***Dose Constraints***

A dose constraint is a specified limit on the radiation dose that could be received from any planned work with ionising radiation and is used to restrict radiation doses as low as reasonably practicable.

The University's dose constraints for all users of ionising radiation are:

- 1mSv / year whole body dose
- 10mSv / year extremity dose.

### ***Personal Dosimetry***

Workers using fully enclosed x-ray systems do not require personal dosimetry. Workers undertaking work on live x-ray beams require personal dosimetry, e.g. undertaking XRD alignment procedures with safety interlocks disabled.

Some equipment is also subject to area dosimetry using TLDs – e.g. CT scanners, DXA equipment.

**Extremity TLDs**

Extremity TLDs are worn underneath disposable gloves on the first finger of the dominant hand or two can be worn, one TLD on each hand.

Extremity TLDs are issued monthly and a batch is placed in the group's main radiation lab at the beginning of each month with a list of authorised wearers. TLDs should be returned to the 'used' container after your period of work or by the end of the month (whichever is sooner).

**Whole body TLDs**

Whole body TLDs are worn either attached to the lab coat top pocket or trouser belt.

TLD badges are issued quarterly by a local 'distributor', and must be returned on the given dates.

**Investigation levels**

Whole body and extremity dose investigation levels are:

- 0.4mSv - a note is made on the dosimetry record
- 0.6 mSv - an investigation is undertaken by the RSC / RPM.

**11. RADIATION MONITORS**

Radiation monitors (if required) are supplied to the group by the RSC or RPM. The correct monitor for each application is specified in section 13.

Monitors used for contamination and dose rate monitoring must be tested and calibrated annually.

Testing is carried out by the RPM and any monitor used should have a valid calibration label.

**12. GENERAL WORKING INSTRUCTIONS**

These instructions cover the radiation protection aspects of work with x-rays. In addition the user must also follow any other local procedures, e.g. lab protocols, COSHH procedures, instructions for the use of equipment, etc.

The user should also read and follow any supplier's / manufacturer's information regarding the use of the equipment.

The following are general instructions for using x-ray equipment. Further specific instructions for the equipment used in this group are given in section 13.

- Do not work with x-ray equipment unless you have been given a local induction, are authorised to use the equipment and know how to operate it safely.
- Do not interfere with, attempt to by-pass or over-ride any safety systems.
- If any hazard warning bulbs fail, or the equipment appears to be 'out of order', does not work or otherwise appears to be malfunctioning, stop working and notify the RPS.
- When not in use x-ray equipment must be left in a safe condition, i.e. switched off, locked-

- off, software password protected, etc.
- Familiarise yourself with the emergency actions (section 14).

### 13. SPECIFIC WORKING INSTRUCTIONS

#### ***Additional instructions specific to equipment***

*(Detail here any instructions or procedures further to those identified in the 'General Working Instructions' (section 12) that are required to restrict exposures for specific x-ray equipment):*

***Equipment:***

- Monthly leakage checks undertaken by RPS using .

#### 14. ACCIDENT PROCEDURES (CONTINGENCY PLAN)

- 1) **Hit the Emergency Stop button:** In an emergency x-ray emission may be stopped by pressing the red STOP button.
- 2) **Deal with life threatening conditions first:** Summon someone trained in First Aid if necessary.
- 3) **Stabilise the Situation:** If possible, return to the x-ray generator and ensure it is switched off and the X-ray source is electrically isolated. Activating the Emergency Stop button should have done this, but it is worth checking. If necessary use a laboratory emergency cut out facility (if present).
- 4) **Prevent Access:** Ensure that no one is able to restart the x-ray generator. Post appropriate warning messages on the machine and remove the keys.
- 5) **Get help:** Contact your RPS and let them know what has happened. If the equipment has been damaged in any way seek advice before using the equipment again.
- 6) **Report:** After the incident has been satisfactorily dealt with you will need to help your RPS to report on what happened via the university's accident reporting system, Sentinel.



