Executive Summary

KEY MESSAGES
NHS Lothian will ensure, as far as is reasonably practicable, the health and safety of members of the public, of its employees and of outside workers working on the premises who may be exposed to the hazards arising from the use of ionising and non-ionising radiations and other sources of artificial optical radiation.

NHS Lothian will ensure that

1. the use of radiation complies with relevant legislation and with approved codes of practice issued by HSE, SEPA and other statutory bodies;
2. radiation dose to staff and members of the public is kept as low as reasonably practicable
3. radiation dose to patients is kept as low as reasonably practicable consistent with the clinical aim
4. sources of ionising radiation are held securely in accordance with current permits and releases of radioactive materials to the environment are properly controlled
5. radiotherapy doses are optimised, maintaining the doses to tissues outside the target volumes as low as reasonably achievable consistent with the clinical aim

MINIMUM IMPLEMENTATION STANDARDS

The Board needs to be both assured of compliance and informed of any deficiencies that require action.

The Radiation Protection Committee meets 3 times a year and receives reports from departmental managers, radiation protection advisers and radiation protection supervisors. Requests for reports will ask for specific information to provide assurances of compliance and for any areas where action is required.

The committee is required to produce annual reports to the Health and Safety Committee.

Every directorate or department that use ionising radiations must have a radiation protection handbook. The handbook must include a copy of this policy, a list of staff with particular responsibility for radiation protection, Local Rules and Systems of Work as required by the Regulations.
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1. **Introduction**

NHS Lothian (The Board) aims to ensure that:

- the use of radiation complies with relevant legislation and with approved codes of practice issued by HSE, SEPA and other statutory bodies;
- the radiation dose to staff and members of the public is kept as low as reasonably practicable;
- the radiation dose to patients is kept as low as reasonably practicable consistent with the clinical aim;
- sources of ionising radiation are held securely in accordance with current authorisations and releases of radioactive materials to the environment are properly controlled;
- radiotherapy doses are optimised, maintaining the doses to tissues outside the target volumes as low as reasonably achievable consistent with the clinical aim.

Relevant Legislation:

- The Ionising Radiations Regulations 2017
- The Ionising Radiation (Medical Exposure) Regulations 2017
- Environmental Authorisations (Scotland) Regulations 2018
- The Medicines (Administration of Radioactive Substances) Regulations 1978
- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations 2011
- Control of Artificial Optical Radiation at Work Regulations 2010

2. **Scope**

This policy sets out the framework to oversee health and safety relating to all uses of ionising and non-ionising radiation within the Board’s area. Compliance with the policy is mandatory for all Board staff in all locations.

3. **Roles, Responsibilities and Arrangements**

Responsible for the protection of staff, patients and visitors from the risks of ionising and non-ionising radiations arising from their use by NHS Lothian rests with the Chief Executive of the Board.

To advise the Board on the safe use of radiations and on compliance with the relevant legislation, NHS Lothian appoints radiation and laser protection advisers (RPAs and LPAs) and Radioactive Waste advisers (RWAs). The advisers are required to report to the Board Radiation Protection Committee (RPC). The organisation reporting structure for radiation protection is set out in Appendix 1 of this policy.

The Board RPC reports to the NHS Lothian Health & Safety Committee. The Medical Director, or another person appointed by the Medical Director, will act as Chairperson and the membership is drawn from Directorates using radiation. The terms of reference of the Board RPC are set out in Appendix 2 of this policy.

The three main directorates using ionising radiation within NHS Lothian are Radiology, Oncology and Nuclear Medicine. Each of these directorates have local which meet 3 times a year in line with the Board RPC. They are chaired by either the relevant Medical Directors or other nominated Service Manager for each respective area and report back to the Board RPC. The terms of reference for the Radiology and Oncology RPCs are set out in Appendix 2 of this policy.

It is the responsibility of Clinical Directors and Heads of Service to ensure that ionising radiations are used in a manner that complies with these policies and procedures.

They must appoint Radiation Protection Supervisors (RPSs) and Laser Protection Supervisors (LPSs) with defined areas of responsibility to assist them in implementing these procedures. Each RPS & LPS must have a managerial or supervisory role within the area for which they have been appointed, their
role must be fully described and they must be given sufficient time and resources to fulfill out their responsibilities.

Every directorate or department using ionising radiations must have a radiation protection handbook. The handbook must include a copy of this policy, a list of staff with particular responsibility for radiation protection, and a copy of the role and responsibilities of the RPS, Local Rules and Systems of Work as required by the Regulations.

The radiation protection handbook must be available to all staff. Relevant sections of the Local Rules must be available to all staff and other people involved in work with ionising radiation, including any persons entering a controlled area.

Departmental Managers are required to ensure that there is a system in place to provide appropriate training to new staff in radiation protection, to update training as required and to keep a record of training.

The level of training should be appropriate and should be relevant to the area of work. Outside workers, not employed by NHS Lothian but working with ionising radiation or in controlled areas in NHS Lothian, should also be given appropriate training.

All staff working with radiation are required to adhere to the Local Rules and to ensure that their actions do not cause any unnecessary exposure to themselves, to patients, to other staff or members of the public. This includes outside workers. They are required to make proper use of protective equipment and personal dosimeters provided by their employer and to report to their line manager any deficiencies in the arrangements for radiation protection. These requirements must be included in the Local Rules.

4. **Ionising Radiation Regulations 2017 (IRR17)**

   a. **Notification, Registration and Consent**

   Regulation of work with ionising radiation is proportionate to the risks associated with that work. A three tiered system of Notification, Registration and Consent is in place, with Classification being the highest risk category.

   Under IRR17, NHS Lothian is required obtain consent from HSE in order to carry out work with ionising radiation.

   b. **Radiation Protection Advisers**

   NHS Lothian appoints Radiation Protection Advisers (RPAs) to advise the Board on how to comply with the Ionising Radiations Regulations 2017. RPA appointments must be in writing and included a defined scope of practise. The RPA must have a certificate of competence in accordance with RPA 2000 or other HSE approved accreditation body and have experience of giving advice in the fields covered by their appointment.

   RPAs are required to report to NHS Lothian through the RPC. They are required to provide an annual report and to notify the Medical Director of any incident requiring notification to a statutory body and any matter that cannot be resolved at Directorate level.

   The role of the RPA is summarised in Appendix 3 of this policy.

   c. **Radiation Protection Supervisors**

   One or more Radiation Protection Supervisors (RPSs) must be appointed by the relevant departmental manager wherever a controlled area has been designated under IRR17

   The departmental manager must ensure that the RPS receives a letter of appointment specifying the areas for which the RPS is responsible. The role of the RPS must be clearly defined and they must be given sufficient time and resources to fulfil their responsibilities.
RPSs must receive suitable training to carry out their duties. The RPA will advise on the nature of the training required. Training must be refreshed at intervals not exceeding five years.

The role of the RPS is to take day-to-day responsibility for working practices in their area to help ensure compliance with Local Rules. A deputy RPS, available to assume responsibility in the absence of the RPS, should be identified in all relevant areas. The deputy RPS should also receive suitable training.

In general, the RPS must be a member of staff with line management responsibilities for the area or areas for which they have been appointed.

d. Radiation Dose Monitoring

Radiation dose monitoring is required to assess personal doses to staff who may receive doses of radiation as a result of their work activities.

Members of staff who are issued with a personal dosimeter must be made aware of their responsibility as an employee to wear their issued dosimeters.

Where doses to individual parts of the body may receive a dose considered significant by the RPA, other dosimeters may be issued to assess the dose in relation to dose limits for individual organs or tissues. The nature and extent of dose monitoring will be specified by the RPA.

Where dosimeters are not routinely issued to individuals, dosimeters may be issued for set periods of time, to a representative sample of staff or on designated positions on radiation equipment to demonstrate that doses are being kept as low as reasonably practicable.

Dose investigation levels have been set, details of which can be found in the Local Rules. Departmental managers must review dose reports and report on DATIX any doses which exceed the relevant monthly or annual dose investigation levels. Departmental managers should also query any unusual doses in a timely manner, even if the investigation level is not exceeded, to help ensure that doses are kept as low as is reasonably practicable.

Environmental dose surveys will be carried out as necessary on new or modified facilities in conjunction with the RPA. Routine environmental monitoring should be carried out at intervals not exceeding 5 years.

Dose monitors are supplied by an Approved Dosimetry Service.

The RPA provides the Board RPC with a summary report of personnel doses annually which includes any recommendations regarding classification or additional PPE measures.

e. Classified Workers

Classification of individual members of staff will be considered if, in any year, the dose to an individual is found to exceed half the level required for classification; that is 3 mSv to the whole body, 8 mSv to the eyes or 75 mSv to extremities. Any staff members who receive an annual collar dose exceeding 8 mSv will be issued with an approved eye dosimeter in order to measure true eye dose; a recorded annual eye dose exceeding 8 mSv will result in classification.

Relevant individuals will be notified in writing prior to being designated as a classified worker, so that appropriate medical examinations and training can be arranged.

Responsibility for the medical supervision of employees designated as classified persons will lie with the Appointed Doctor.

The RPA will provide the Appointed Doctor with an annual dose summary for all employees designated as classified workers. Radiation passbooks will be issued to all classified workers, containing up to date estimates of radiation doses.
f. **Outside Workers**

Outside workers are workers who are not employed by NHS Lothian, who carry out services or work in Supervised or Controlled Areas within NHS Lothian. Outside workers may be classified or non-classified outside workers.

Appropriate training and PPE must be provided to outside workers prior to entering Controlled Areas. Outside workers have the same legal duties with regards to their health and safety as NHS Lothian employees. Co-operation between NHS Lothian and employers of outside workers is required in order to communicate details of the work to be carried out, estimates of radiation doses, any dose monitoring required, the relevant contingency arrangements and emergency procedures. Dose constraints for outside workers should be established in cooperation with the employer of the outside worker.

g. **Radiation Risk Assessment**

Prior to a new radiation facility or any other new or significantly changed activity involving work with ionising radiation, it is the responsibility of the RPS or Service Lead to advise the RPA of this development. The departmental manager, in conjunction with the RPA, will assess the radiation risk arising from that development as required by Regulation 8 of IRR17.

The risk assessment should consider the nature of sources of ionising radiation, estimated radiation, likelihood of contamination, any relevant previous dosimetry or environmental monitoring, safe systems of work and the effectiveness and suitability of any PPE. Possible accident situations, including their likelihood and severity, as well as consequences of failures of control measures must also be considered.

For identified accident situations which are deemed to be reasonably foreseeable, practical measures must be identified to prevent the accident occurring or restrict the exposure of those affected.

Following the assessment any special measures required for area designation, restriction of access, working procedures, dose monitoring, etc. will be implemented and recorded in Local Rules as necessary. Practical measures for the restriction of exposure in the case of reasonable foreseeable radiation accidents will be implemented and recorded as Contingency Plans.

The radiation risk assessment must include a date for review which must not be more than 3 years from the initial assessment.

The relevant departmental manager will be responsible for ensuring that radiation risk assessments are performed, reviewed and the findings implemented.

h. **Local Rules**

Local Rules should include Written Arrangements for the safe use of ionising radiations. Departmental managers are required to ensure that Local Rules have been put in place for all uses of ionising radiation within their areas of responsibility and Written Arrangements are in place for all Controlled Areas. The RPA will advise and assist in drafting Local Rules and in reviewing them on a regular basis.

Responsibility for the task of supervising the work with radiation and ensuring that it is done in accordance with these Local Rules will lie with the RPS.

Departmental managers must ensure that any staff who are involved in work with ionising radiations in their area have read the relevant sections of the Local Rules that apply to that work, and a record is kept of the names of staff who have read the rules. Any persons entering a Controlled Area, including outside workers, should also read the relevant Local Rules.

i. **Radiation Incidents**

Radiation incidents are reported through NHS Lothian’s standard incident reporting procedure; DATIX. The Radiation Protection section of Medical Physics is notified of all such incidents automatically via
DATIX. This notification instigates an investigation with the relevant department and/or associated staff groups.

Reports of the investigation are prepared, giving estimates of dose and recommendations and are sent to the appropriate responsible manager. The RPA will advise if the incident needs to be notified to the HSE or other statutory body. In such instances the RPA will provide a report to the Medical Director in NHS Lothian without undue delay.

The RPA will provide the Radiation Protection Committee with a summary of incidents involving ionising radiations.

**Staff**

Staff incidents include a monthly dose record equal to or greater than the dose investigation level as detailed in the Local Rules. The investigation is carried out by the RPS together with the RPA. Doses in excess of any dose limit are notified to the HSE.

**Patients**

Patient incidents which involve clinically significant exposures must be notified to the Scottish Ministers. In the absence of guidance on which exposures are deemed clinically significant, multiplicative factors for equipment related incidents are used in accordance with HSE Guidance Note PM77 (Third Edition) and for all other incidents in accordance with Department of Health Guidance. This is a requirement of the Ionising Radiation (Medical Exposure) Regulations and subject to the NHS Lothian Policy for IRMER.

Incidents involving loss or spillage of radioactive materials must be reported to the RPS, RPA and the RWA. Incidents involving the suspected loss or theft of radioactive materials must also be reported to the Scottish Environmental Protection Agency (SEPA). The RPS, RPA and departmental manager will be responsible for ensuring that an investigation is undertaken and RPA and/or RWA will advise on any further action.

### 1. Radiation Equipment

Responsibility for ensuring that all radiation equipment is installed, critically examined, commissioned and maintained to satisfy radiation safety requirements and is included in the equipment replacement programme of the Board will lie with the relevant Director.

All equipment purchases will be routed through appropriate committees (e.g. LMERG) established by the Board. In conjunction with the RPAs and MPEs, these committees will ensure that any equipment purchased is designed, constructed and installed so that it is capable of restricting exposure in line with the intended clinical purpose.

Prior to installation of any equipment delivering ionising radiation to patients (including hire & loan, modified and/or relocated equipment), the RPA and (MPE) will be consulted.

All radiation equipment must have a critical examination before it is brought into clinical use. The critical examination is the installer’s responsibility but it is policy that NHS Lothian’s RPA be involved and liaise with the equipment installer over the tests that are performed. Equipment will not be put into use until the RPA is able to confirm that the critical examination was satisfactory.

### 5. The Environmental Authorisations (Scotland) Regulations 2018 (EASR)

Responsibility for ensuring that systems are in place for the use and safeguarding of radioactive materials, for the accumulation and safe disposal of radioactive waste and ensuring that all requirements of the Environmental Authorisation (Scotland) Regulations 2018 are satisfied will lie with the Chief Executive.

The Board will appoint appropriately qualified Radioactive Waste Advisers (RWAs) to advise on the
handling of radioactive materials and disposal of radioactive waste, as required by the EASR.

The Board will appoint a Dangerous Goods Safety Adviser with appropriate qualifications to advise, in consultation with an RPA, on transport of radioactive materials and radioactive waste.

Radioactive materials are allowed on the hospital premises if they are included in Permits, issued by SEPA under the terms of the EASR. The RPA corresponds with SEPA to revise these as necessary.

The RWA allocates proportions of the total hospital allowance to individual departments. Copies of the appropriate Permits and the department allocation are displayed in each department.

Radioactive waste is disposed of as allowed by each hospital’s Permit, issued by SEPA under the terms of the EASR. Details of the various methods of disposal are contained in the Local Rules for Radiosotope Departments. RPSs should ensure that these procedures are followed and that records are maintained for inspection.

Departmental RPSs supply annual summaries of radioactive waste disposals to the RWA to allow compliance with the Permit to be monitored. The RWA reports the radioactive waste returns annually, on behalf of NHS Lothian, to the Scottish Pollutant Release Inventory (SPRI).

6. **Ionising Radiation (Medical Exposure) Regulations 2000 (IRMER)**

IRMER applies to all medical exposures involving ionising radiations. There is a separate policy for the implementation of IRMER in NHS Lothian.

7. **Laser and other non-ionising radiations**

The safe use of lasers and other non-ionising radiations by NHS Lothian is subject to the following legislation: Control of Artificial Optical Radiation at Work Regulations 2010; the Health and Safety at Work Act 1974; Management of Health and Safety at Work Regulations 1999; Provision and Use and Work Equipment Regulations 1992; Personal Protective Equipment at Work Regulations 1992.

Guidance on the safe use of lasers for medical and dental procedures is given by the MHRA. Much of the authoritative scientific guidance on exposure levels that underpins the AOR Regulations and MHRA guidance is produced by the International Commission for Non-Ionising Radiation Protection (ICNIRP). The health effects of acoustic radiation are the subject of a Health Protection Agency report, and authoritative guidance on the safe use of ultrasound for medical diagnosis and therapy is published by the World Federation for Ultrasound in Medicine and Biology (WFUMB), the European Federation for Ultrasound in Medicine and Biology (EFSUMB) and, within the UK, by the British Society for Ultrasound in Medicine and Biology (www.bmus.org).

**Laser Protection Adviser**

NHS Lothian appoints a Laser Protection Adviser, who is normally a staff member experienced in giving advice in the field of medical lasers and other high-intensity sources of non-ionising radiation. Advice regarding other forms of non-ionising radiation (e.g. MR imaging, ultrasound, RF/microwaves) is also provided by the Medical Physics Department.

**Local Rules**

Heads of Service are required to ensure that Local Rules are put in place for all uses of Class 3R, 3B and Class 4 lasers and Intense Pulsed Light (IPL) systems within their areas of responsibility. The LPA will advise and assist in the drafting of Local Rules, approve the final version, and review them on a regular basis.

**Laser Protection Supervisors**

Clinical Directors and Heads of Service must appoint Laser Protection Supervisors (LPSs) to take day-
today responsibility for ensuring that work is carried out in accordance with the Local Rules and any other control measures identified by a risk assessment. The Head of Service, Clinical Director or other appropriate manager must consult with the LPA over whether the individual’s general responsibilities are suitable for the role of LPS. In general, the LPS must be a member of staff with line management responsibilities for the area or areas for which they have been appointed.

The extent of training required as an LPS depends on the type of laser work undertaken, and also on previous training and experience. Training should be updated at regular intervals of no more than 5 years and records of training kept.

Laser Risk Assessment

When a new laser procedure or new equipment is planned, it is the responsibility of the LPS or Clinical Director to advise the LPA of this development. The LPA will assist the LPS in carrying out and documenting a risk assessment. Following this assessment, and subject to approval by the LPA, any special measures required for area designation, restriction of access, working procedures, training etc. will be implemented and included in Local Rules as necessary. The risk assessment must be reviewed at intervals not exceeding 3 years.

Laser Equipment

All new or loan Class 3R, 3B and Class 4 laser equipment and IPL systems must be approved by the LPA prior to being put into clinical use. The LPA will advise of any other tests required, their timing, and any necessary documentation. All laser equipment must be regularly calibrated, serviced and maintained to a defined schedule based on the manufacturer’s recommendations.

Incidents

Instances of overexposure or potential overexposure to laser light or other intense sources of non-ionising radiation are investigated by the LPA. Incidents requiring investigation include exposure of unprotected eyes to laser light exceeding the maximum permissible exposure and laser burns to any part of the body. A report of the investigation and any consequent recommendations are sent to the LPS and the appropriate manager.

A record will be made on DATIX by LPSs of any incidents involving medical lasers or IPL systems. The LPS will notify the LPA directly of all such incidents, and the LPA will investigate, report, and provide advice on any further action.

Other sources of Artificial Optical Radiation

Under the Control of Artificial Optical Radiation at Work Regulations 2010, NHS Lothian has a duty to ensure staff are adequately protected during work involving sources of artificial optical radiations. To enable risk assessments to be carried out, the Laser Protection Advisor must be notified when a piece of equipment containing a source of artificial optical radiation is procured. Exclusions from this are items which, given the low nature of hazard involved, do not require a formal risk assessment and can be classified as “Trivial Sources” such as overhead room lighting, UVA insect traps, presentation equipment and gas-fired radiant heaters.


ICNIRP guidelines on exposure to non-ionising radiations [www.icnirp.de](http://www.icnirp.de)

8. **Therapeutic use of visible, ultraviolet and infrared light and ultrasound**

**Risk assessment and Local Rules**

When a new therapy protocol or procedure is planned, it is the responsibility of the appropriate Clinical Director to advise the LPA of this development. The LPA will assist in carrying out and documenting a risk assessment. Following this assessment, and subject to approval by the LPA, any special measures required such as radiation dosimetry, Local Rules, working procedures, training etc. will be will be documented and implemented. The risk assessment must be reviewed at intervals not exceeding 3 years.

**Therapy Equipment**

All new or loan therapy equipment employing visible, ultraviolet, infrared light or ultrasound must be approved by the LPA prior to being put into clinical use. The LPA will advise of any other tests required, their timing, and any necessary documentation. All equipment must be regularly calibrated, serviced and maintained to a defined schedule based on the manufacturer’s recommendations.

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9. **Safety in Magnetic Resonance Imaging**

Hazards associated with magnetic resonance imaging (MRI) are the static magnetic field, time varying magnetic fields, pulsed radiofrequency electromagnetic fields, acoustic noise and those associated with the use of cryogens (liquid or gaseous helium). The hazards apply to staff, patients and any other persons who may come into the vicinity of the scanner or, additionally in the case of helium, the quench pipe.

NHS Lothian Radiology Department are responsible for organising routine inspection of the integrity of the quench pipe and to ensure that any necessary maintenance work is carried out.


NHS Lothian appoints MR Safety Experts who are Medical Physicists trained and experienced in giving advice in this field.

Relevant Clinical Directors must appoint MR Responsible Person(s) to take day-to-day responsibility for MR safety in departments where MRI is carried out.

The MR Responsible Person together with the MR Safety Expert must ensure that Local Rules for safe working with MR are in place for each MRI Department. The MR Local Rules must be subject to regular review.

Entry to the MR Controlled Access Area is only permitted to MR Authorised Personnel whose authorisation is made through the MR Responsible Person, who must ensure that they have had adequate training. Other persons (including patients) may only enter the Controlled Access Area when accompanied by an MR Authorised Person and after they have completed a screening questionnaire and no adverse indications have been identified. Procedures for access to the MR Controlled Access Area in the event of an emergency should be provided and reviewed as necessary with the assistance of the MR Safety Expert. These procedures should be readily available in the event of an emergency.

Exposure to EMF shall be managed within the framework of the Management of Health and Safety at Work Regulations and the Electromagnetic Fields at Work Regulations 2016, ensuring that the following are in place:

- Risk assessments
- Controlled Access Areas
- High magnetic field areas shown on a plan on display within the Department
- Appropriate staff training

The MR Safety Committee reviews policies, procedures, incidents and other matters relating to MR
Safety and reports to the NHS Lothian Radiation Protection Committee. The terms of reference for the MR Safety Committee are set out in Appendix 2 of this policy.

10. Monitoring Compliance and Effectiveness

The Board must be both assured of compliance and informed of any deficiencies that require action.

The RPA is required to review arrangements for radiation protection annually. Matters to be reviewed include: radiation protection documentation including Local Rules and risk assessments, staff doses and personal protective equipment. For radioactive materials, contamination monitoring records, radioactive waste records and compliance with the The Environmental Authorisations (Scotland) Regulations 2018 (EASR) are reviewed. The form of the review is individual meetings with Radiation Protection Supervisors and a general inspection of the department. Generally, there are separate reviews of matters concerned with x-rays and with radioisotopes. Reports are issued to the Clinical Director and the appropriate manager and provided to Directorate Radiation Protection Committees. Any significant findings are included in the RPA’s report to the Board RPC. The LPA and MRSE also report any issues to the Board RPC.

The Radiation Protection Committee meets 3 times a year and receives reports from departmental managers, radiation RPAs and RPSs. Requests for reports will ask for specific information to provide assurances of compliance and for any areas where action is required. A verbal report, accompanied with the minutes of the Board RPC are tabled at the Health and Safety Committee.

Reports will give an assessment of the level of compliance with regulations and highlight any areas of non-compliance or other issues that need to be brought to the attention of the Board. The Board can then take such measures as it sees fit to rectify any deficiencies in compliance that cannot be dealt with within the committee and line management structure.
Appendix 1: Organisational Reporting Structure for Radiation Protection

Chief Executive

NHS Board

NHS Lothian Health & Safety Committee

NHS Lothian Radiation Protection Committee

Managers of areas using Radiation

Specialist Advisers (RPA, RWA, LPA, MRSA)

Sub-Committees (XRPC, RRPC, CSRPC, MRSC)

RPA: Radiation Protection Adviser
RWA: Radioactive Waste Adviser
LPA: Laser Protection Adviser
MRSE: Magnetic Resonance Safety Expert
Appendix 2: Terms of Reference of Radiation Protection Committees

Terms of Reference of NHSL Radiation Protection Committee

Purpose
To provide an overview of the management of radiation protection in NHS Lothian. In particular:
- to approve radiation protection policies for NHS Lothian and to review these;
- to approve generic Local Rules and systems of work;
- to approve written procedures required by the Ionising Radiation (Medical Exposures) Regulations (IRMER);
- to consider reports from the RPAs, LPA and MR Safety Adviser;
- to review annual summaries of occupational radiation exposures received by staff and radiation incident reports;
- to review compliance with registrations for radioactive materials and authorisations for disposal;
- to approve new practices and installations that involve ionising and non-ionising radiations;
- to approve Diagnostic Reference Levels;
- to review arrangements for the appointed doctor required by IRR99;
- to provide advice on emergency planning for incidents involving radioactive materials;
- to provide an annual report.

Scope
The Committee will be concerned with radiation protection requirements for all uses of ionising radiations within NHS Lothian and for potential exposures to staff or patients from other sources of ionising radiations. It will be concerned with protection from non-ionising radiations in particular laser, microwave, ultrasound, visible and ultra-violet sources of radiation used for medical diagnosis or treatment, and with protection from the hazards associated with MR imaging.

Membership
Chairman to be appointed by the Chief Executive
IRMER Policy Lead
Director of Imaging
Clinical Director of Cancer/ Palliative Care Services (or representative)
Clinical Director of Laboratories (or representative)
Clinical Director of Cardiology (or representative)
Clinical Director of Oral Health Service (or representative)
Service Director, DATCC
Chief Radiographer
Principal Radiopharmacist
Radiation Protection Advisers
Laser Protection Adviser
MR Safety Expert
Head of Oncology Physics or Oncology Lead Radiographer
Partnership representative(s)
The University of Edinburgh RPA

Meetings
The Committee will meet at least twice a year with additional meetings being called as required.

Reporting arrangements
The Committee will be a sub-Committee of the NHS Lothian Health & Safety Committee. The Chair of the Radiation Protection Committee reports to the NHSL H&S Committee on behalf of the Committee.
Terms of Reference of X-ray Radiation Protection Committee

Membership
All NHS Lothian X-ray RPS
NHS Lothian RPA or Deputy
Appointed MPE

Chair
The Chair of the X-ray RPC is appointed by the Radiology Chief Radiographer, as more X-ray RPSs are from within Radiology. It is suggested that the Chair must hold a senior management position within Radiology i.e Chief Radiographer or Radiology Manager. However, the position is also open to senior RPSs. The Chair is appointed for a three-year term which is renewable.

Frequency of Meetings
Meetings will be held at least twice a year to coincide with the NHS Lothian Radiation Safety Committee. Additional meetings may be arranged when required.

Record of meetings
The committee shall maintain minutes of its meetings. Relevant items will be copied to the Lothian Radiation Protection Committee.
The appointed secretary will have responsibility for the minutes.
Minutes will be sent to all members of the committee.

Reporting Mechanism
All members will be invited to declare any items/issues arising for the agenda prior to the meeting.
Written reports will be presented to the Lothian Radiation Protection committee by the designated RPA.

Purpose
The committee is established to oversee and ensure an effective radiation safety programme on a local level within NHS Lothian Departments where x-rays are used. The committee will ensure conformance and continuity of documentation concerning the radiation protection of staff and members of the public.

Objectives
1. To ensure the requirements of the statutory Ionising Radiation Regulations, Approved Code of Practice and Medical and Dental Guidance Notes and all other appropriate statutory requirements are complied with at all times by means of written Local Rules.
2. Each departmental RPS to provide the committee with an update report on the state of radiation protection arrangements within their area.
3. To note all formal reports from RPA
4. To highlight and seek advice from Lothian RPC on the measures to be taken when specified problems in the management of radiation protection are identified.
5. To receive annual reports from the RPA on the state of radiation protection measures within relevant sections.
6. To inform the committee of any changes in working areas or practices involving ionising radiation.
7. To inform the committee of any situation where it considers necessary to “Classify” a member of staff. (If this situation were to occur, the sub-committee would be required to seek approval from Lothian RSC)
8. To review annual personal dosimetry records.
9. To review radiation incident reports.
10. To review risk assessments.
11. To report to the Lothian Radiation Protection Committee after each meeting.
Terms of Reference of Cancer Services Radiation Protection Committee

Purpose
The Cancer Services Radiation Safety Committee is established to oversee and ensure an effective radiation safety programme on a local level within Edinburgh Cancer Centre which includes:

- Radiotherapy (including pre-treatment and on-treatment imaging)
- Brachytherapy (sealed radiation sources - HDR & LDR)

The Committee does not cover:

- Wards – covered by Radioisotope Radiation Safety Committee
- Mammography – covered by X-Ray Radiation Safety Committee

The aim of this committee is to provide assurance on compliance with IRR, IRMER, RSA, MARS, and all other legislation relevant to:

- the radiation protection of staff, patients and members of the public
- the protection of the environment and source security

at Edinburgh Cancer Centre.

Remit

- To review compliance with all relevant legislation
- To inform the committee of any changes in working areas or practices involving ionizing radiation
- To review Local Rules, systems of work and practical protection issues
- To review IRR risk assessments
- To review IRMER Level 2 procedures
- To receive reports from the RPA including annual reviews of radiation protection in ECC
- To receive reports from RPSs regarding radiation protection arrangements within their area
- To review personal radiation dose records
- To review staff training in relation to radiation safety
- To monitor/review radiation incident reports and ensure that appropriate follow up action has been taken
- To review clinical practice against Diagnostic Reference Levels and exposure packages (where relevant)
- To consider radiation protection implications of new equipment projects or changes in treatment techniques
- To advise the AMD on completion of the annual audit report required by NHS Lothian’s IRMER procedures

Reporting

The Committee reports to the Radiotherapy Management Group and will submit an annual report to the NHS Lothian Radiation Protection Committee on behalf of Cancer Services.

Membership

As this is a Committee which covers both IRR and IRMER, it can be chaired by either the Associate Medical Director or the General Manager. However the position is also open to senior RPSs. The chair is appointed for a three year term which is renewable.

AMD / Clinical Director / General Manager or deputy
Head of Oncology Physics or deputy
Head of Therapeutic Radiography or deputy
Radiation Protection Adviser for Oncology or deputy
All Radiotherapy & Brachytherapy Radiation Protection Supervisors

The Committee will generate a formal minute of each meeting.

Meetings

The Committee shall meet not less than twice a year to coincide with the NHS Lothian RPC. Additional meetings may be arranged when required.
Terms of Reference Radionuclide Radiation Protection Committee

Membership
Head of Nuclear Medicine Physics
Appointed Radiation Protection Adviser
Appointed Radioactive Waste Adviser
All NHS Lothian Radionuclide RPS

- Non-Imaging Diagnostic Radionuclide areas including:
  - Theatres (SLNB)
  - GFR services
- Radionuclide Imaging including PET
- In-patient therapies including Brachytherapy
- Out-patient therapies
- Radiopharmacy
- Nuclear Medicine Radiologist – corresponding members

Members of the Nuclear Medicine Physics team

Chair of RRPC
The committee should all agree on the chair for the committee. The chair must be a member of the committee and hold a senior position either within Nuclear Medicine Physics or Radiology. The usual term for the chair should be 2 years. If the chair wishes to remain in post longer, this must be agreed by the committee.

Frequency of Meetings
Meetings will be held at twice a year to coincide with the NHS Lothian Radiation Protection Committee. Additional meetings may be arranged when required.

Record of meetings
The committee shall maintain minutes of its meetings. Relevant items will be copied to the Lothian Radiation Safety Committee.

The appointed secretary will have responsibility for the minutes. Minutes will be sent to all members of the committee.

Reporting Mechanism
All members will be invited to declare any items/issues arising for the agenda prior to the meeting.
Written reports will be presented to the Lothian Radiation Protection committee by the appointed RPA.

Purpose
The committee is established to oversee and ensure an effective radiation safety programme on a local level within NHS Lothian Departments using radionuclides. The committee will ensure conformance and continuity of documentation concerning the radiation protection of staff and members of the public.

Objectives
1. To provide pertinent feedback from the Lothian Radiation Protection Committee.
2. To provide pertinent feedback to the Lothian Radiation Protection Committee.
3. To help ensure the requirements of the Ionising Radiations Regulations 2017 are being met by users of radionuclides across NHS Lothian by:
   a. Ensuring any new work or change in working practice has been identified, highlighted to the Head of Nuclear Medicine Physics and appointed RPA, with a suitable risk assessment performed.
   b. Ensuring that a review has been performed in each user area of control measures by reviewing staff monitoring, environmental monitoring and contamination monitoring.
   c. Reviewing and making formal applications to change dose investigation levels.
   d. Ensuring that periodic examination and testing of engineering controls has been performed.
   e. Ensure Local Rules for each area using radionuclides is suitable and has been appropriately reviewed.
   f. Take forward to the Lothian Radiation Protection Committee any procedural or radiation safety governance changes for authorisation.
   g. Review incidents involving exposure to staff and members of the public from work involving ionising radiation.
4. Each departmental RPS to highlight areas of potential concern regarding radiation protection arrangements within their area and compliance with the regulations.
5. To receive annual reports from the RPA on the state of radiation protection measures within relevant sections.
6. To inform the committee of any changes in working areas or practices involving ionising radiation.
### Terms of Reference of NHS Lothian MR Safety Committee

#### Purpose
- To have oversight of MR safety issues across the Health Board(s), including changes in safety legislation, guidelines and technology and the communication of these issues within the Health Board(s)
- To ensure regional policies, procedures and risk assessments governing the use of MRI are revised and updated as required
- To review the safety audit programme and MR incident statistics on an annual basis
- To identify and oversee safety improvement actions in order to ensure best practice is maintained in MR safety across the Health Board

#### Scope
The Committee will be concerned with MRI safety in all Departments in which NHS Lothian patients may routinely be scanned. MR Responsible Persons from NHS Fife, Edinburgh Imaging QMRI and RIE facilities, and Borders Health Board are therefore invited to attend.

#### Membership
- **Chair** – Head of Imaging Physics / MR Safety Expert, NHS Lothian
- MR Safety Experts, NHS Lothian
- Chief Radiographer, NHS Lothian
- MR Responsible Persons, NHS Lothian
- Consultant Radiologist, NHS Lothian, West Sector
- Consultant Radiologist, NHS Lothian, East Sector
- MR Responsible Person, NHS Fife
- MR Responsible Person, NHS Borders
- MR Safety Expert, Edinburgh Imaging QMRI
- MR Safety Expert, Edinburgh Imaging RIE
- MR Responsible Person, Edinburgh Imaging QMRI
- MR Responsible Person, Edinburgh Imaging RIE

#### Meetings
The Committee will meet at least twice a year with additional meetings being called as required.

#### Reporting arrangements
The Committee is a sub-committee of the NHS Lothian Radiation Protection Committee. The Chair reports to the Lothian and Fife Radiation Protection Committees on behalf of MR Safety Committee.
Appendix 3: Role and Responsibilities of the Radiation Protection Advisers

Radiation Protection Advisers, Laser Protection Advisers and MR Safety Experts appointed by NHS Lothian are senior staff from the Department of Medical Physics. In addition to their duties as RPAs, they are required to fulfil roles laid down in other legislation. The responsibilities and duties arising from the various sets of regulations overlap and this document describes particular duties without distinguishing between the four roles that are detailed below.

Radiation Protection Adviser (RPA)

The RPA has a general duty to provide advice to NHS Lothian in accordance with Regulation 14 and Schedule 4 of the Ionising Radiations Regulations 2017 (IRR17) and the relevant Approved Code of Practice and guidance published by the HSE in “Work with Ionising Radiation”. In particular this involves:

- making prior risk assessments for new activities involving the use of ionising radiations;
- identification of radiation hazards and designation of controlled and supervised area;
- advice on the significance of radiation protection legislation and the means of compliance;
- assistance with the drafting of radiation protection policies and other documentation required by legislation;
- provision of guidance and training to Radiation Protection Supervisors;

Radioactive Waste Adviser

The Board will appoint appropriately qualified Radioactive Waste Advisers (RWA) to advise on handling of radioactive materials and disposal of radioactive waste, as required by the Authorisations granted under the Environmental Authorisations (Scotland) Regulations 2018 (EASR). The board will consult the RWA on the following matters:

- achieving and maintaining an optimal level of protection of the environment and the population;
- checking the effectiveness of technical devices for protecting the environment and the population;
- acceptance into service, from the point of view of surveillance of radiation protection, of equipment and procedures for measuring and assessing, as appropriate, exposure and radioactive contamination of the environment and the population; and
- regular calibration of measuring instruments and regular checking that they are serviceable and correctly used.

Qualified Person

NHS Lothian employs a Qualified Person as required by IRR17 for the testing of radiation monitoring equipment. This role is the responsibility of the Head of Nuclear Medicine Physics or the RPA for Nuclear Medicine.

Laser Protection Adviser (LPA)

The LPA has a duty to provide advice to NHS Lothian in accordance with the guidance given MHRA Device Bulletin: “Guidance in the safe use of Lasers, intense light source systems and LEDs in medical, surgical, dental and aesthetic practices DB2008(3)”. This involves:

- Identification of hazards from lasers and other types of optical radiation devices and assessments of risks.
- Advice on the significance of health and safety legislation and necessary action to ensure compliance.
- Assistance with the preparation of radiation protection policies, Local Rules and other documentation required for adequate risk management.
- Provision of guidance and training to Laser Protection Supervisors.
- Provision of advice to the Board and NHS staff on any matters relating to laser safety.

In addition to advice on the safe use of lasers, the LPA provides advice on the safe use of other nonionising radiations including ultraviolet and infrared radiations and ultrasound, and approves dosimetry / protocols etc.

MR Safety Expert

The MR Safety Expert has a duty to provide advice to NHS Lothian in accordance with the guidance given MHRA
Device Bulletin: “Safety guidelines for magnetic resonance imaging equipment in clinical use 2015.” This involves:

- Identification of hazards associated with MR imaging equipment and assessments of risks.
- Advice on the significance of health and safety legislation and necessary action to ensure compliance.
- Assistance with the preparation of MR safety policies, Local Rules and other documentation required for adequate risk management.
- Provision of guidance and training to MR Responsible Persons.

**Diagnostic X-rays**

**X-ray equipment**

The RPA will work closely with the Head of Imaging Physics to undertake the following duties:

- advise on the dosimetric specification of new x-ray equipment to ensure that it is capable of restricting doses to patients as far as reasonably practicable;
- advise on the layout of new x-ray installations and the construction of protection barriers;
- make a “critical examination” of new x-ray equipment before it is placed into clinical service;
- liaise with equipment suppliers in carrying out acceptance and commissioning tests on new equipment;
- make a critical examination of modified equipment and of equipment which has had a significant repair such as the replacement of an x-ray tube or of an image intensifier insert;
- manage a programme of performance testing of equipment with the purpose of ensuring continuing compliance with radiation protection standards; monitoring standards of maintenance; assessing the extent to which in performance leads to loss in image quality and increased patient dose. The test programme including protocols and test frequencies are determined by the professional judgement of the RPA taking account of published guidance, in particular IPEM Report 77 on the performance testing of X-ray equipment;
- assist radiographic staff in establishing in-house QA programmes;
- advise on the dosimetric consequences of continuing to use equipment whose performance has deteriorated and on priorities for equipment replacement in respect of radiation protection.

**Patient doses**

The RPA manages a programme of dose audit for patients having x-ray examinations. Measured doses are compared with national and local reference values. Doses in excess of these levels are investigated to determine causes of high doses. Recommendations for dose reduction are made. A full report of the results is sent to the Department. Audits are made following the installation of new equipment and full, departmental audits on a 3 yearly cycle.

The RPA reviews the results of all dose audits in NHS Lothian annually and provides a report making recommendations in regard to Lothian diagnostic reference levels. Doses may be assessed on an ad hoc basis such as in connection with a research project or for the foetus of a pregnant patient.

**Radioisotopes**

The RPA will work closely with the Head of Nuclear Medicine Physics to undertake the following duties:

- supply Local Rules;
- advise on the purchase and quality assurance of equipment in conjunction with the Head of Nuclear medicine physics;
- submit applications for Permits under the Environmental Authorisations (Scotland) Regulations to the Scottish Environment Protection Agency (SEPA), allocate proportions to individual departments, collate disposal records, monitor compliance with authorised limits and submit reports to SEPA;
- advise on procedures for the disposal of radioactive clinical waste;
- perform radiation protection surveys of individual departments and accompany SEPA, HSE and Scottish
Executive staff during inspections;
- complete applications to the Administration of Radioactive Substances Advisory Committee (ARSAC) and maintain copies of all current ARSAC certificates;
- provide radiation dose estimates for procedures involving radiopharmaceuticals;
- provide advice and monitoring following accidental exposure or contamination;
- perform acceptance testing, calibration and quality control of contamination monitors, dose rate meters and radionuclide calibrators;
- advise on radiation protection requirements for new and modified buildings and procedures;
- provide advice on the requirements of new, draft and existing legislation in relation the use, transport and disposal of radioactive materials.

Radiotherapy
In Radiotherapy the RPA will work closely with Consultant Medical Physicists in the Oncology Physics Department. Working closely with them, the RPA will:
- carry out prior risk assessments for all new work with ionising radiations and review these as part of the annual review of radiation protection in Oncology;
- inspect and approve shielding assessments made for new installations;
- review and approve Local Rules;
- advise on the designation of controlled and supervised areas;
- assist in preparing applications for Permits under the Environmental Authorisations (Scotland) Regulations;
- advise on the regulatory aspect of the care and safe storage of radioactive materials.

Medical lasers
The LPA will undertake the following duties:
- carry out risk assessments for all new work involving lasers and non-ionising radiations;
- advise on the specification of new laser equipment to ensure that it fulfils the relevant regulations and international safety standards, and is fit-for-purpose;
- review and approve Local Rules;
- advise on the designation of controlled areas and the design of laser installations;
- advise on the purchase and quality assurance of equipment;
- liaise with clinical staff and equipment suppliers in acceptance testing and commissioning new equipment;
- advise on the regulatory aspects of the use of medical lasers.

Review
The RPA (and LPA) reviews arrangements for radiation protection annually. Matters to be reviewed include: radiation protection documentation including Local Rules and risk assessments, staff doses, QA arrangements, personal protective equipment. In addition, for x-rays, equipment performance reports and records of the protection system are checked. For radioactive materials contamination monitoring records, radioactive waste records, ARSAC certificates and compliance with The Environmental Authorisations (Scotland) Regulations 2018 (EASR) are reviewed. The form of the review is individual meetings with Radiation Protection Supervisors and a general inspection of the department. Generally there are separate reviews of matters concerned with x-rays and with radioisotopes. Reports are issued to the Clinical Director and the appropriate manager and findings discussed at appropriate Radiation Protection Committees. Any significant findings are included in the RPA’s report to NHS Lothian.

Investigation of incidents
Instances of significant accidental or unintended overexposure to patients, staff or visitors will be notified to the RPA and investigated by the RPS and RPA. Incidents requiring investigation include: overexposure due to the malfunction of an x-ray set, examination of the wrong patient, x-ray examination of the pelvis of a patient who is pregnant, administration of the wrong radiopharmaceutical, administration of a radiopharmaceutical to a patient who is pregnant, and contamination of
individuals, equipment or premises. Reports of the investigation are prepared giving estimates of dose and recommendations. They are sent to the appropriate RPS. The RPA will advise if the incident needs to be notified to the HSE or other statutory body. In such instances the RPA will provide a report to the Medical Director or other nominated officer in NHS Lothian without undue delay.

Instances of overexposure or potential overexposure to laser light or other intense sources of non-ionising radiation are investigated by the LPA. Incidents requiring investigation include exposure of unprotected eyes to laser light exceeding the maximum permissible exposure and laser burns to any part of the body. A report of the investigation and any consequent recommendations are sent to the LPS and the appropriate manager.

**Staff dose monitoring**

Dose monitors are supplied by an Approved Dosimetry Service (ADS). The role of the RPA is:

- advise on the selection of the ADS;
- advise on who is to be monitored;
- advise on the need for additional monitoring, for example monitoring of finger doses;
- monitor reports received from the ADS, highlight any unexpected results and assist the RPS in investigating high and unusual doses;
- maintain annual dose records supplied by the ADS and to provide annual dose summaries;
- advise on the need to designate staff as classified persons.

**Training**

The RPA and LPA advise on appropriate training for staff in radiation protection and will provide such training as resources allow. The RPA and LPA provide training for newly appointed RPSs and LPSs respectively.

**Emergency planning**

As part of its service to NHS Lothian and NHS Fife, the RPA provides advice on emergency planning. This includes attending training exercises and overseeing the setting up of a radiation screening unit in the event of a major radiation incident.

**Useful Documentation:**

- NHS Lothian H&S Manual
- NHS Lothian Incident Management Operational Policy

**Glossary of Terms:**

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<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>ADS</td>
<td>Approved Dosimetry Service</td>
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<td>AOR</td>
<td>Artificial Optical Radiations</td>
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<td>ARSAC</td>
<td>Administration of Radioactive Substances Advisory Committee</td>
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<td>EASR</td>
<td>Environmental Authorisations (Scotland) Regulations</td>
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<td>ECC</td>
<td>Edinburgh Cancer Centre</td>
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<tr>
<td>EFSUMB</td>
<td>European Federation for Ultrasound in Medicine and Biology</td>
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<tr>
<td>HSE</td>
<td>Health and Safety Executive</td>
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<td>ICNIRP</td>
<td>International Commission for Non-Ionising Radiation Protection</td>
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<td>IPL</td>
<td>Intense Pulsed Light</td>
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<td>IRMER</td>
<td>Ionising Radiation (Medical Exposure) Regulations</td>
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<td>IRR</td>
<td>Ionising Radiations Regulations</td>
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<td>LMERG</td>
<td>Lothian Medical Equipment Replacement Group</td>
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<td>LPA</td>
<td>Laser Protection Adviser</td>
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<td>LPS</td>
<td>Laser Protection Supervisor</td>
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<td>MHRA</td>
<td>Medicine and Healthcare products Regulatory Agency</td>
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<td>MPE</td>
<td>Medical Physics Expert</td>
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<tr>
<td>MR</td>
<td>Magnetic Resonance</td>
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<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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<td>Acronym</td>
<td>Description</td>
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<td>QA</td>
<td>Quality Assurance</td>
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<td>Radiation Protection Supervisor</td>
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<td>RWA</td>
<td>Radioactive Waste Adviser</td>
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<td>SEPA</td>
<td>Scottish Environment Protection Agency</td>
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<td>SPRI</td>
<td>Scottish Pollutant Release Inventory</td>
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<tr>
<td>UVA</td>
<td>UltraViolet A</td>
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<tr>
<td>WFUMP</td>
<td>World Federation for Ultrasound in Medicine and Biology</td>
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