

## Monash University Procedure

<b>Procedure Title</b>	Ionising Radiation Dosimetry Procedure
<b>Parent Policy</b>	<a href="#">OHS Policy</a>
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<b>Scope</b>	The processes outlined in this document apply to staff, students, visitors and contractors at the Australian campuses of Monash University.
<b>Purpose</b>	This procedure sets out the requirements for the correct use of dosimetry for monitoring of radiation exposure to staff or students who are exposed to ionising radiation as part of their work or study at Monash University.

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## 1. Abbreviations

EPD	Electronic Personal Dosimeter
mSv	millisieverts
OSL	Optically Stimulated Luminescence Osimeter
RSO	Radiation Safety Officer
RPO	Radiation Protection Officer

## 2. Definitions

**Designated Radiation Area:** A designated radiation area is any area that is under the supervision of an RSO. These areas include storage facilities, laboratories or other areas where sources of ionising radiation are present and exposures may be above background levels.

**Dosimetry:** Dosimetry is the measurement of radiation dose.

**Electronic Personal Dosimeters (EPD):** Electronic Personal Dosimeters give a real-time record of the amount of radiation received to the worker during the wearing period. These are an alternative form of dosimeter to OSLs.

**Monash Action Levels:** The Monash Action Levels are the quantity of radiation that if exceed in a dosimetry report, prompts an investigation on the radiation worker's activity. The Monash Action Levels are defined as:

- An annual effective dose of 1mSv, observed on a pro rata basis throughout the monitoring period. This is equivalent to the public limit as defined in Schedule 2, Table B of the Radiation Regulations 2017.
- An annual extremity dose of 50mSv, observed on a pro rata basis throughout the monitoring period.

**Radiation Protection Officer:** The Radiation Protection Officer is the OH&S staff member responsible for providing and coordinating radiation protection services at Monash University.

**Radiation Safety Officer:** A Radiation Safety Officer is a designated staff member in a unit responsible for approving and supervising the ionising radiation work and study of staff and students.

**Radiation Worker:** A radiation worker is a staff member or student who is exposed to ionising radiation as a result of working with ionising radiation source(s) as part of their work/study.

**OSL Dosimeter:** OSL dosimeter badges are the standard means used to measure external radiation dose to radiation workers on an ongoing basis.

## 3. Dosimetry Procedures

### 3.1. Dosimetry Requirements

3.1.1. All radiation workers must have their radiation dose monitored by wearing an OSL. Organisational units may choose to allow exceptions from this requirement as described in 3.1.2 and 3.1.3:

3.1.2. For individual workers:

- The worker will only be exposed to forms of ionising radiation that cannot be measured using an OSL (e.g. low-energy beta emitters)

OR

- Risk Assessment shows that the work undertaken by the radiation worker cannot plausibly lead to a cumulative dose in excess of 1000  $\mu\text{Sv}$  per year (including consideration of accidents such as a stock solution spill) due to low dose rates received and/or limited time spent on radiation tasks.

#### 3.1.3. For a facility:

- A formal dose rate assessment of the radiation sources (e.g. X-ray analysis units) in the facility shows that working in the facility cannot plausibly lead to a cumulative external dose approaching the regulatory 'member of the public' limit of 1000  $\mu\text{Sv}$  per year.

3.1.4. If an organisational unit chooses to permit exemptions from the OSL requirement, the exemptions must be discussed with the RPO before being applied. Alternative dosimetry methods such as EPDs should be considered for persons who are individually exempted.

3.1.5. The existence and conditions of any such exemptions must be documented in the local Radiation Management Plan.

### 3.2. Training

3.2.1. The required [training](#) must be completed before the method of dosimetry is issued to the radiation worker.

### 3.3. Pregnancy

3.3.1. The RSO must arrange for the monitoring of radiation users who have declared their pregnancy, with a radiation badge changeover at regular 4 weekly intervals. For further information on radiation use during pregnancy refer to the [Protecting Unborn and Breast-Fed Children from the Effects of Maternal Exposure to Chemicals, Biologicals, Animals and Radiation Procedure](#).

### 3.4. Use of OSL

3.4.1. The radiation worker with an OSL must wear their OSL badge at all times while undertaking radiation work.

3.4.2. Radiation badges must be worn at all times when entering areas where wearing a OSL badge is mandated.

3.4.3. OSL badges must be submitted by their wearer for changeover:

- At the end of each regular wearing period;
- Immediately, in circumstances of a suspected high exposure; and
- On a 4 weekly basis in the case of declaring their pregnancy.

### 3.5. OSL Dosimetry Result

3.5.1. The RPO must ensure that a copy of all OSL results is received and kept at OH&S.

3.5.2. The RPO must examine dose results, investigate any results over the Monash Action Level and communicate the results to the RSO and the radiation worker.

3.5.3. The RSO must examine dose results, investigate any unexpected dose results and communicate the results to the RPO and the radiation worker.

3.5.4. The RPO must maintain a record of all OSL results above the Monash Action Levels.

### 3.6. Radiation Work Investigation

Where the dosimetry result indicates an unexpected dose result or a dose result above the Monash Action Level, the following action must be taken:

3.6.1. The RSO, in conjunction with the RPO, must investigate to attempt to determine the possible cause of the result or if the result is erroneous.

3.6.2. The RSO, in conjunction with the RPO, must determine what corrective actions are necessary to prevent further exposures above the Monash Action Level.

- 3.6.3. The RPO must maintain a record of the actions taken in investigating these results and any corrective actions taken.
- 3.6.4. The RSO must assist workers to implement the appropriate corrective actions.
- 3.6.5. The radiation worker must:
- Cooperate with any investigation into exposures over the Monash Action Level; and
  - Assist the RSO to implement appropriate corrective actions to prevent further exposures above the Monash Action Levels.

## 4. Responsibility for Implementation

A comprehensive list of OHS responsibilities is provided in the [OHS Roles, Responsibilities and Committees procedure](#). A summary of responsibilities with respect to this procedure is provided below.

**Head of Academic/Administrative Unit:** The head of academic/administrative unit is responsible for:

- Ensuring that an up to date and feasible OSL badge allocation system is maintained and administered in their unit, when OSLs are deemed appropriate for monitoring radiation dose; and
- Facilitating all radiation workers in successfully completing relevant ionising radiation training before they use ionising radiation.

**Radiation Safety Officer:** The radiation safety officer is responsible for administering personal monitoring programs for users of radioactive substances, including:

- Ensuring that the new radiation user follows the dosimetry procedure for the entire period of working with ionising radiation;
- Examining dose results and initiating investigation where results are unexpectedly high; and
- Working with the RPO to investigate results, which exceed the Monash Action Levels.

**Radiation Protection Officer:** The Radiation Protection Officer is responsible for:

- Selecting a suitable external provider to facilitate the badge allocation system;
- Maintaining a database of all dose results for all OSL badge wearers within the University.
- Examining all dose results and initiating and coordinating investigation of results which exceed the Monash Action Levels.
- Providing advice on alternative dosimetry methods when OSLs are not appropriate for the radiation work being conducted.

**Radiation Worker:** Each radiation worker must follow the dosimetry procedure as outlined for the entire period of working with ionising radiation.

## 5. Records

For OHS Records document retention please refer to:  
[Monash University OHS Records Management Procedure](#)

<b>Status</b>	Revised
<b>Approval Body</b>	<b>Monash University OHS Committee</b>
<b>Legislation Mandating Compliance</b>	Radiation Act (2005) Radiation Regulations 2017
<b>Related Policies</b>	<a href="#">OHS Policy</a>
<b>Related Documents</b>	<p><b>Australian Standards</b></p> <p>AS/NZ 2243.4:2018 Safety in Laboratories: Ionising radiation</p> <p><b>Other documents</b></p> <p>Department of Health and Human Services: Mandatory radiation safety requirements – Management licence holder’s obligations</p> <p><b>Monash University OHS Documents</b></p> <p><a href="#">OHS Roles, Responsibilities, and Committees Procedure</a></p> <p><a href="#">Protecting Unborn and Breast-Fed Children from the Effects of Maternal Exposure to Chemicals, Biologicals, Animals and Radiation Procedure</a></p> <p><a href="#">Using Ionising Radiation Procedure</a></p>

## 6. Document History

Version	Date of Issue	Changes made to document
3	May 2013	Ionising radiation thermo-luminescent dosimetry procedures
4	May 2016	<ol style="list-style-type: none"> <li>1. Changed name to Ionising radiation dosimetry procedures</li> <li>2. Widened scope to include other forms of ionising radiation dosimetry</li> <li>3. Added section regarding advice from RPO for alternative methods of dosimetry</li> <li>4. Rearranged procedure section to be based on tasks rather than responsibilities.</li> <li>5. Added section requiring TLDs for radiation work and exemptions to this requirement.</li> </ol>
4.1	August 2017	<ol style="list-style-type: none"> <li>1. Updated logos in header</li> <li>2. Updated Radiation Regulations to 2017</li> </ol>
5	September 2018	<ol style="list-style-type: none"> <li>1. Change of TLD to OSL throughout to reflect change in dosimeters provided by ARPANSA.</li> <li>2. Specific details added on when workers can be exempt from OSL dosimetry, and the requirements for approving and documenting exemptions.</li> </ol>