1. PURPOSE
The University of Melbourne (University) Radiation Management Plan (Plan):

- supports the Ionising radiation risk management procedure;
- outlines the University systems and processes for establishing an effective dose limit for all ionising radiation practices and use of radiation sources to a total whole body exposure to 1 mSv annually; and
- establishes the University systems and processes to comply with regulatory requirements.

2. SCOPE
The Plan applies to all staff, students and others that may be exposed to a radiation source and subsequent exposure as a result of the University’s:

- radiation practices; and
- use of radiation sources.

3. DEFINITIONS
Definitions are outlined in the Ionising radiation risk management procedure.

4. DOSE LIMITS
The University “dose limits” requirements are outlined in the Ionising radiation risk management procedure.

University dose limit for ionising radiation activities has been limited to a total whole body exposure to 1 mSv annually.

The nature of some radiation activities, such as diagnostic nuclear medicine, will expose staff to greater than 1 mSv annually. In these cases the total whole body exposure must not exceed 20 mSv annually.

5. RADIATION WEB SITE
The University “radiation web site” requirements are outlined in the Ionising radiation risk management procedure.

The scope of University radiation web page includes the entire electromagnetic spectrum. With regards to ionising radiation the web page will take into account requirements of University procedures and relevant legislation.

The content of the University Radiation web page includes:

- procedures
- guidance materials
- committees and groups
- radiation safety certification program
- training
- radiation safety contacts
6. RADIATION SAFETY CONTACTS

The University “radiation safety contacts” requirements are outlined in the Ionising radiation risk management procedure. The Associate Director, Health & Safety appointed radiation safety advisor (RSA) is determined by their training, skills and experience with regards to radiation.

<table>
<thead>
<tr>
<th>University of Melbourne Radiation Safety Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steve Guggenheimer</td>
</tr>
</tbody>
</table>

For initial ionising radiation enquiries contact radiation-info@unimelb.edu.au.

Each Head of Department/School, with the assistance of the RSA, appointed departmental radiation safety officer (DRSO) is determined by their training, skills and experience with regards to radiation.

Departmental Radiation Safety Officers

7. LICENSING

The University “licensing” requirements are outlined in the Ionising radiation risk management procedure.

7.1. Commonwealth Reporting

University “Commonwealth reporting” requirements are outlined in the Ionising radiation risk management procedure.

7.2. State Licensing

University “State Licensing” requirements are outlined in the Ionising radiation risk management procedure.

7.2.1. Management Licence

University “Management Licence” requirements are outlined in the Ionising radiation risk management procedure.

The Management Licence is divided into schedules that categorise radiation practices. The conditions for each radiation practice are determined in these schedules. The conditions include:

- publications issued by the Department of Health and Human Services (DHHS);
- publications issued by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) – Radiation Protection Series (RPS); and
- publications originally issued by the National Health and Research Council (NHRC) and under review by ARPANSA – Radiation Health Series (RHS).

There are nine schedules applicable (with associated conditions) listed on the University Management Licence. These are described in the following table.
**Schedule 1: General Licence Conditions** *(Licence conditions that all ionising radiation users and areas must comply with)*

<table>
<thead>
<tr>
<th>No</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>Where this licence permits the disposal of a sealed source, a sealed source apparatus or other types of radioactive material, the management licence holder must ensure the disposal complies with the requirements of the document titled 'Disposal of Radioactive Material' published by the Department and available from <a href="http://www.health.vic.gov.au/radiation">www.health.vic.gov.au/radiation</a>. Where this licence permits the disposal of ionising radiation apparatus (e.g. X-ray units) or non-ionising radiation apparatus (e.g. commercial tanning units), the management licence holder must notify the Department within 14 days of the disposal occurring. The notification must be made using the Internet Notification Form at <a href="http://www.health.vic.gov.au/radiation">www.health.vic.gov.au/radiation</a>. Where this licence permits the possession of a radiation source, the management licence holder must notify the Department after taking possession of the radiation source within the following time periods using the Internet Notification Form at <a href="http://www.health.vic.gov.au/radiation">www.health.vic.gov.au/radiation</a> within: a) 24 hours of taking possession of a security enhanced source as defined by the 'Code of Practice for the Security of Radioactive Sources (2007)' as published by the Australian Radiation Protection and Nuclear Safety Agency; and b) 14 days of taking possession of other types of sealed sources or sealed source apparatus; and c) 14 days of taking possession of ionising radiation apparatus (e.g. X-ray units) or non-ionising apparatus (e.g. commercial tanning units). Note that for the purposes of the Radiation Act 2005, relocation of a radiation source to a destination outside Victoria is considered to be a form of disposal.</td>
</tr>
</tbody>
</table>

**Schedule 1: Practice Specific Conditions** *(Licence conditions that ionising radiation users and areas must comply with when undertaking a specific practice associated with ionising radiation)*

<table>
<thead>
<tr>
<th>No</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1608</td>
<td>The management licence holder must comply with the 'Statement on cabinet X-ray equipment for examination of letters, packages, baggage, freight and other articles for security, quality control and other purposes (1987)' published by the National Health and Medical Research Council. Notwithstanding any reference to radiation dose limits in the Code of Practice, the radiation dose limits in the Radiation Act 2005 and Radiation Regulations 2007 will apply.</td>
</tr>
<tr>
<td>M1611</td>
<td>The management licence holder must comply with the obligations of the ‘responsible person’ in the 'Code of Practice for Radiation Protection in Dentistry (2005)' as published by the Australian Radiation Protection and Nuclear Safety Agency. Notwithstanding any reference to radiation dose limits in the Code of Practice, the radiation dose limits in the Radiation Act 2005 and Radiation Regulations 2007 will apply.</td>
</tr>
<tr>
<td>M1614</td>
<td>The management licence holder must comply with the document titled 'Mandatory radiation safety requirements' published by the Department and available from <a href="http://www.health.vic.gov.au/radiation">www.health.vic.gov.au/radiation</a></td>
</tr>
<tr>
<td>M1615</td>
<td>The management licence holder must comply with the obligations of the ‘responsible person’ in the 'Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (2008)' as published by the Australian Radiation Protection and Nuclear Safety Agency. Notwithstanding any reference to radiation dose limits in the Code of Practice, the radiation dose limits in the Radiation Act 2005 and Radiation Regulations 2007 will apply.</td>
</tr>
<tr>
<td>M1627</td>
<td>The management licence holder must in the transport of any radioactive material authorised to be possessed by this licence comply with the 'Code of Practice for the Safe Transport of Radioactive Material (2008)' as published by the Australian Radiation Protection and Nuclear Safety Agency.</td>
</tr>
<tr>
<td>M1619</td>
<td>The management licence holder must comply with the obligations of the 'Responsible Person' in the 'Code of Practice for Portable Density/Moisture Gauges Containing Radioactive Sources (2004)' as published by the Australian Radiation Protection and Nuclear Safety Agency. Notwithstanding any reference to radiation dose limits in the Code of Practice, the radiation dose limits in the Radiation Act 2005 and Radiation Regulations 2007 will apply.</td>
</tr>
<tr>
<td>M1626</td>
<td>The management licence holder must in the consigning for transport of any radioactive material authorised to be possessed by this licence comply with the Consignor’s Responsibilities in the 'Code of Practice for the Safe Transport of Radioactive Material (2008)' as published by the Australian Radiation Protection and Nuclear Safety Agency. The management licence holder must be satisfied that the contract carrier holds a management licence issued under the Radiation Act 2005 authorising the transport of the radioactive material.</td>
</tr>
</tbody>
</table>
The management licence holder must comply with the obligations of the 'user' and satisfy all relevant requirements of the 'Code of Practice for Protection Against Ionizing Radiation Emitted from X-ray Analysis Equipment (1984)' as published by the National Health and Medical Research Council. Notwithstanding any reference to radiation dose limits in the Code of Practice, the radiation dose limits in the Radiation Act 2005 and Radiation Regulations 2007 will apply.

The licence holder must:
1. Ensure that research involving the exposure of persons to ionising radiation is carried out in accordance with the Code of Practice for the Exposure of Humans to Ionising Radiation for Research Purposes (2005) published by the Australian Radiation Protection and Nuclear Safety Agency; and
2. Where the proposed radiation doses to persons for any research project are proposed to exceed the dose constraints listed in Table 1 of this Code; ensure that:
   a) Independent authoritative advice in relation to the justification for the radiation exposure is available to the Human Research Ethics Committee; and
   b) Using the Research Notification Form at www.health.vic.gov.au/radiation, the Department is notified within 14 days of the research project receiving site authorisation at the institution.

The management licence holder must:
• Have a system in place to ensure that the site of in situ legacy radioactive material is not modified without approval from the Department of Health; and
• Have a system in place to ensure that the purpose for the site of in situ legacy radioactive material is not modified without approval from the Department of Health; and
• Prepare a twelve monthly report which contains a radiation dose assessment in relation to the retained in situ legacy radioactive material. This report must be submitted to the Department of Health no later than the first working day after 1 September of each year.

For the purpose of medical radiography, the management licence holder must:
1. Comply with the obligations of the ‘responsible person’ in the ‘Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (2008)’ as published by the Australian Radiation Protection and Nuclear Safety Agency. Notwithstanding any reference to dose limits in the Code of Practice, the radiation dose limits in the Radiation Act 2005 and Radiation Regulations 2007 will apply; and
2. Have a system in place to ensure that the medical imaging procedure is conducted in accordance with a written request from a medical practitioner and that the written request for the medical imaging procedure includes reasons that are specific to the patient’s size and weight; and
3. Maintain records of medical imaging procedures.

### Prescribed Radiation Source

<p>| Schedule 2: Radiation Practices Involving Possession of Ionising Radiation Apparatus that are Prescribed Radiation Sources |</p>
<table>
<thead>
<tr>
<th>Prescribed Radiation Source</th>
<th>Condition Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid SPECT-PET/computed tomography unit</td>
<td>M1615</td>
</tr>
<tr>
<td>Medical fixed fluoroscopy x-ray unit</td>
<td>M1615</td>
</tr>
<tr>
<td>Veterinary and medical computed tomography unit</td>
<td>M1629, M1674</td>
</tr>
</tbody>
</table>

### Schedule 3: Radiation Practices Involving Possession of Ionising Radiation Apparatus that are not Prescribed Radiation Sources

<p>| Schedule 3: Radiation Practices Involving Possession of Ionising Radiation Apparatus that are not Prescribed Radiation Sources |</p>
<table>
<thead>
<tr>
<th>Prescribed Radiation Source</th>
<th>Condition Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-ray analysis unit (incorporating an x-ray unit)</td>
<td>M1630</td>
</tr>
<tr>
<td>Cabinet x-ray unit/baggage scanner</td>
<td>M1608</td>
</tr>
<tr>
<td>Dental cephalometric and/or panoramic x-ray unit</td>
<td>M1611</td>
</tr>
<tr>
<td>Dental intra-oral x-ray unit</td>
<td>M1614</td>
</tr>
<tr>
<td>Micro computed tomography unit (less than 100kV &amp; 5mA)</td>
<td>M1614</td>
</tr>
<tr>
<td>Bone mineral densitometer</td>
<td>M1629</td>
</tr>
<tr>
<td>Veterinary fixed fluoroscopy x-ray unit</td>
<td>M1629</td>
</tr>
<tr>
<td>Computed tomography</td>
<td>M1614</td>
</tr>
<tr>
<td>Prescribed Radiation Source</td>
<td>Condition Number</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Bone mineral densitometer - medical radiography</td>
<td>M1615</td>
</tr>
<tr>
<td>X-ray analysis unit (incorporating an x-ray unit) - education &amp; research not involving exposure of humans to ionising radiation</td>
<td>M1630</td>
</tr>
<tr>
<td>Fixed general x-ray unit - education &amp; research not involving exposure of humans to ionising radiation</td>
<td>M1614</td>
</tr>
<tr>
<td>Bone mineral densitometers - education &amp; research not involving exposure of humans to ionising radiation</td>
<td>M1614</td>
</tr>
<tr>
<td>Veterinary mobile general x-ray unit - veterinary diagnostic radiography</td>
<td>M1629</td>
</tr>
<tr>
<td>Particle accelerator - education &amp; research not involving exposure of humans to ionising radiation</td>
<td>M1614</td>
</tr>
<tr>
<td>Dental intra-oral x-ray unit - veterinary diagnostic radiography</td>
<td>M1629</td>
</tr>
<tr>
<td>Veterinary fixed general x-ray unit - veterinary diagnostic radiography</td>
<td>M1629</td>
</tr>
<tr>
<td>Veterinary mobile fluoroscopy x-ray unit - veterinary diagnostic radiography</td>
<td>M1629</td>
</tr>
<tr>
<td>Mobile x-ray analysis unit (incorporating an x-ray unit) - analysis of materials</td>
<td>M1630</td>
</tr>
</tbody>
</table>

**Schedule 4: Radiation Practices Involving Sealed Source Apparatus**

*Practices associated with sealed source apparatus that may or may not expose humans to ionising radiation*

<table>
<thead>
<tr>
<th>Description</th>
<th>Condition Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed radiation gauge (incorporating a sealed source) - measurement of product characteristics</td>
<td>M1612, M1626</td>
</tr>
<tr>
<td>Sealed source apparatus - education &amp; research not involving exposure of humans to ionising radiation</td>
<td>M1614, M1626</td>
</tr>
<tr>
<td>Portable density/moisture gauge - measurement of moisture content &amp;/or density of materials</td>
<td>M1619, M1626, M1627</td>
</tr>
<tr>
<td>Sealed source apparatus - storage</td>
<td>M1614, M1626</td>
</tr>
</tbody>
</table>

**Schedule 5: Radiation Practices Involving Sealed Sources**

*Practices associated with sealed sources that may or may not expose humans to ionising radiation*

<table>
<thead>
<tr>
<th>Description</th>
<th>Condition Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sealed source - education &amp; research not involving exposure of humans to ionising radiation</td>
<td>M1614, M1626</td>
</tr>
<tr>
<td>Sealed source - storage</td>
<td>M1614, M1626</td>
</tr>
<tr>
<td>Sealed source - calibration of instrumentation</td>
<td>M1614, M1626</td>
</tr>
</tbody>
</table>

**Schedule 6: Radiation Practices Involving Unsealed Radioactive Material**

*Practices associated with unsealed radioactive material that may or may not expose humans to ionising radiation*

<table>
<thead>
<tr>
<th>Description</th>
<th>Condition Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsealed radioactive material - education and research not involving exposure of humans to ionising radiation</td>
<td>M1614, M1626</td>
</tr>
<tr>
<td>Unsealed radioactive material - storage</td>
<td>M1614, M1626</td>
</tr>
<tr>
<td>Unsealed radioactive material - diagnostic nuclear medicine</td>
<td>M1615, M1626</td>
</tr>
<tr>
<td>Unsealed radioactive material - veterinary diagnostic nuclear medicine</td>
<td>M1626, M1629</td>
</tr>
<tr>
<td>Unsealed radioactive material - veterinary therapeutic nuclear medicine</td>
<td>M1626, M1629</td>
</tr>
</tbody>
</table>

**Schedule 8: Radiation Practices Not Involving Possession of Radiation Sources**

*Practices associated with procuring, arranging or conducting research involving irradiation of persons*

<table>
<thead>
<tr>
<th>Description</th>
<th>Condition Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation sources - Procure, arrange or conduct research involving the irradiation of persons</td>
<td>M1687</td>
</tr>
</tbody>
</table>

**Schedule 9: Definitions**

*Definitions and terms associated with the Management Licence*

**Schedule 10: Offences**

*Offences and penalties associated with the Management Licence*
The conditions of the University Management Licence may alter from time to time based on:

- changes to radiation practices and use of radiation sources that require varying the licence;
- changes to legislation; or
- changes to instructions/conditions from the DHHS.

### 7.2.2. Use Licence

The University “Use Licence” requirements are outlined in the [Ionising radiation risk management procedure](http://www.health.vic.gov.au/radiation/employees.htm).

A Department/School Use Licence register must be maintained and include:

- the name of the Use Licence holder;
- the allowed radiation use; and
- the expiry date of the Use Licence.

Requirements for Use Licenses, including exemptions to hold a Use Licence are published by the DHHS at:


### 8. RISK ASSESSMENT AND CONTROL

The University “risk assessment and control” requirements are outlined in the [Ionising radiation risk management procedure](http://www.health.vic.gov.au/radiation/employees.htm).

Hazard identification and risk analysis for ionising radiation activities must take into account the:

- ionising radiation properties of the radiation source including:
  - the type, energy and activity of the ionising radiation;
  - the dose rate of the ionising radiation; and
  - the route of exposure of the ionising radiation; and

- other hazards associated with the ionising radiation activity such as:
  - plant;
  - chemical;
  - manual handling; and
  - biological.

Risk assessment methodology for ionising radiation activities must include the requirements of the [OHS risk management procedure](http://www.health.vic.gov.au/radiation/employees.htm).


### 9. STANDARD OPERATING PROCEDURE

The University “standard operating procedure” requirements are outlined in the [Ionising radiation risk management procedure](http://www.health.vic.gov.au/radiation/employees.htm).

Standard operating procedures (SOPs) for ionising radiation activities must take into account the:

- ionising radiation properties of the radiation source including:
  - the type, energy and activity of the ionising radiation;
  - the dose rate of the ionising radiation; and
  - the route of exposure of the ionising radiation; and
other hazards associated with the ionising radiation activity such as:
  o plant;
  o chemical;
  o manual handling; and
  o biological.

The University Standard Operating Procedure form can be used to develop and record ionising radiation SOPs.

10. SHIELDING

The University “shielding” requirements are outlined in the Ionising radiation risk management procedure.

Radiation shielding must be re-assessed when:

- the frequency of use of the radiation source changes; or
- the radiation source is upgraded; or
- the surrounding room occupancy is altered.

11. MONITORING

The University “monitoring” requirements are outlined in the Ionising radiation risk management procedure.

11.1. Personal Monitoring

The University “personal monitoring” requirements are outlined in the Ionising radiation risk management procedure.

Staff and students who require personal monitoring will be provided with a personal thermoluminescent dosimetry monitor (TLD). The frequency for analysing the TLD monitor will be determined by the ionising radiation activity but will not exceed every three months.

Personal monitoring results are analysed by a NATA accredited laboratory and forwarded to the relevant DRSO and RSA for review and retention in accordance with the OHS documentation procedure.

11.2. Area Monitoring

The University “area monitoring” requirements are outlined in the Ionising radiation risk management procedure.

Types of area monitoring include:

- contamination monitoring:
  completed by staff or students prior to, during and following activities that use radioactive materials, in particular open sources

- area survey:
  completed by the DRSO or RSA for radiation activities that use x-ray emitting apparatus

- compliance testing:
  completed by an authorised tester registered by the DoH for radiation activities that use x-ray emitting apparatus on humans

Monitoring results for area surveys and compliance testing must be retained in accordance with the OHS documentation procedure.
12. LABELLING, SIGNAGE AND STORAGE

The University “labelling, signage and storage” requirements are outlined in the Ionising radiation risk management procedure. Radiactive material must be clearly labelled with the following information:

- the radionuclide;
- the activity of the radioactive material;
- the date the activity was measured; and
- where applicable, the requirements of the Chemical risk management procedure.

Rooms containing radioactive material must be clearly signed at access points to the room and clearly display:

- the ionising radiation hazard symbol;
- the words, Caution Radioactive Material;
- the letters and symbol in black on a yellow background; and
- the requirements of the Signage – OHS requirements procedure.

Radiation apparatus must be clearly labelled with the following information:

- the ionising radiation hazard symbol; and
- the symbol in black on yellow background.

Rooms containing radiation apparatus must be clearly signed at access points to the room and clearly display:

- the ionising radiation hazard symbol and the written warning (x-ray unit in this area);
- the letters and symbol in black on yellow background; and
- the requirements of the Signage – OHS requirements procedure.

Storage of radiation sources must:

- display the ionising radiation hazard symbol (the symbol in black on yellow background); and
- restrict access to authorised staff and students.

13. PURCHASING

The University “purchasing” requirements are outlined in the Ionising radiation risk management procedure. The University Management Licence number is held by the Associate Director, Health & Safety.

A Manager/supervisor who requires the University Management Licence number to purchase radiation sources must contact the Associate Director, Health & Safety or delegate. The Associate Director, Health & Safety or delegate will contact the manufacturer/supplier with regards to the University Management Licence number.

14. INVENTORY

The University “inventory” requirements are outlined in the Ionising radiation risk management procedure. A radiation inventory records all radiation sources:

- radioactive material;
- radiation apparatus; or
- sealed source apparatus.
15. TRAINING

The University “training” requirements are outlined in the Ionising radiation risk management procedure. The purpose of the ionising radiation training is to ensure that all staff and students working with radiation sources:

• understand the radiation principles and radiation controls that will reduce personal radiation exposure; and
• understand the requirements of University relevant procedures.

Training can be arranged by:

• contacting the RSA; or
• booking on-line through Themis.

Refer to Health & Safety Training web page for more details.

The Associate Director, Health & Safety shall ensure that the University of Melbourne Radiation Safety Advisor receives Advanced Radiation Safety Officer Training through the Australia Nuclear Science and Technology Organisation (ANTSO) or the equivalent.

16. DISPOSAL AND WASTE MANAGEMENT

The University “disposal and waste management” requirements are outlined in the Ionising radiation risk management procedure. Radioactive material activity that falls below the limits defined in Regulation 5(a)(b) of the Radiation Regulations 2007 (Vic) can be disposed of through the University hazardous waste collection service.

Staff and students disposing of waste, as described above, through the hazardous waste collection service must:

• comply with Waste risk management procedure;
• submit details of the waste including:
  o quantity (in kilos or litres);
  o number of containers; and
  o type of waste;
• clearly label the waste; and
• remove all radiation labels.

Refer to the Hazard Waste Collection web site for more details.

17. TRANSPORT

The University “transport” requirements are outlined in the Ionising radiation risk management procedure.

Labelling

An excepted package must not be labelled with a radioactive transport label. An excepted package label must:

• include the words “radioactive material excepted package”; and
• include the United Nations dangerous goods number (UN) of the radioactive material.

Packaging

The packaging of the radioactive material must be:

• sturdy enough to be transported – the original packaging, where available, must be used;
• packed with absorbent material for open sources;
• sealed; and
• labelled with an excepted package label.

18. INCIDENTS REQUIRING NOTIFICATION

Radiological incidents that require notification to the DHHS are outlined on the DHHS web site:

Mandatory reporting of incidents

The University incidents requiring notification to the DHHS requirements are outlined in the Ionising radiation risk management procedure.

19. EMERGENCY MANAGEMENT

The University “emergency management” requirements are outlined in the Ionising radiation risk management procedure.

All ionising radiation emergency procedures must include the relevant emergency contact number(s) for the location where the emergency occurred.

20. LABORATORY CERTIFICATION

The University “laboratory certification” requirements are outlined in the Ionising radiation risk management procedure.

With regards to ionising radiation, laboratory certification comprises five categories:

• management;
• laboratory practices;
• training;
• incident reporting and emergency procedures; and
• details of the radiation source(s) in use

The duration of laboratory certification is for two years.