



<b>Policy Hierarchy link</b>	<a href="#">OHS Policy</a>		
<b>Responsible Officer</b>	Human Resources, Director		
<b>Contact Officer</b>	<a href="#">Radiation Safety Officer</a> or ext. 52912		
<b>Superseded Documents</b>	Ionising Radiation Procedure v4.1		
<b>File Number</b>	TRIM: 2007-1241		
<b>Associated Documents</b>	<ul style="list-style-type: none"> <li>• IAEA, Basic Safety Standards, 1996</li> <li>• NSW Radiation Control Act, 1990</li> <li>• NSW Radiation Control Amendment Act 2010</li> <li>• NSW Radiation Control Regulation, 2003</li> <li>• AS/NZS 2243.4 Safety in Laboratories Part 4: Ionising Radiations, 1998</li> <li>• AS /NZS 2982.1 Laboratory design and construction Part 1: General requirements</li> <li>• Commonwealth of Australia Code of Practice for the Safe Transport of Radioactive Substances, 2008</li> <li>• ICRP Publication 60: 1990,1991 Recommendations of the International Commission on Radiological Protection.</li> <li>• OHS436-2006 Reliability Testing Procedure for Ionising Radiation Detectors</li> <li>• OHS303-2006-Ionising Radiation Beta Emitters Spill Procedure</li> <li>• OHS302-2006- Ionising Radiation Gamma/X-ray emitters Spill Procedure</li> <li>• Radiation Laboratory Safety for Cleaners Guideline <i>Scintillant disposal</i></li> </ul>		
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## 1. Purpose and Scope

To protect the health of staff, students, visitors to the University, teaching hospitals and other off campus locations, from the effects of using and storing ionising radiation used in research projects [and provide compliance with legislative requirements](#). This procedure details the management system designed to maintain all ionising radiation exposures as low as reasonably achievable (ALARA); and to minimise adverse environmental consequences from ionising radiation use at UNSW facilities.

## 2. Definitions

For the purpose of this procedure, the definitions below apply.

### 2.1 Ionising radiation

Electromagnetic or particulate radiation capable of producing ion pairs in biological material(s) but does not include electromagnetic radiation of wavelength greater than 100 nanometres. (IAEA, 1994)

### 2.2 Radioactive substance

Any substance which emits ionising radiation spontaneously with a specific activity greater than 100 becquerels per gram AND which contains more than the prescribed activity (40kBq, 400 kBq, 4MBq or 40 MBq for radionuclides in Group 1, 2 3 or 4 respectively). (NSW Radiation Control Regulation, 2003)

### 2.3 Radiation apparatus:

A manufactured or assembled article or component which in operation contains or acts as part of an electrical circuit and emits (or in the absence of effective shielding or other control would emit) ionising radiation. (NSW Radiation Control Act, 1990 )

Apparatus used for radiotherapy or planning radiotherapy must be registered.

A licence is required to:

- possess radiotherapy apparatus
- sell radiotherapy apparatus
- use radiotherapy apparatus
- buy radiotherapy apparatus.

(NSW The *Radiation Control Act 1990* and the *Radiation Control Regulation 2003*)

## 2.4 Radiological accident

Australian Standard AS 2243.4 – 1998 Safety in laboratories Part 4 Ionizing radiation defines a radiological accident as:-

- (a) Suspected exposure of a person to radiation greater than one-fifth of the relevant dose limit given in Table 4.1 of the Standard.
- (b) Radioactive contamination on a person or clothing exceeding 50 derived working limits
- (c) An intake of radioactive substances greater than one-fifth of the relevant Annual Limit on Intake (ALI)
- (d) A spillage of unsealed radioactive substance in excess of 20 ALI
- (e) A fire or explosion damaging the room (or its contents) in which radioactive substances are used or stored
- (f) Loss of, or damage to, a sealed source or its container, or loss of more than 20 ALI of an unsealed radioactive substance.

The Radiation Control Regulation 2003 (Reg 26) defines a radiation accident as:

- 1) An occurrence that involves the unplanned or unexpected emission of radiation (including spillage or leakage of a radioactive substance or damage to radiation apparatus) AND that is of such a nature or extent that it is likely:
  - a) that one or more persons have or could have received a dose of radiation equal to or in excess of:
    - i) 5 millisieverts, in the case of an occupationally exposed person; or
    - ii) 1 millisievert in any other case; or
  - b) that the premises or the environment may have become contaminated within the meaning of Section 21 of the NSW Radiation Control Act, 1990.
- 2) An occurrence that involves the misuse of radiation apparatus or the maladministration of a radioactive substance used for medical purposes including any of the following:
  - a) the administration of a radioactive substance for diagnostic purposes in a quantity of more than 50 per cent over that prescribed.
  - b) the administration of a radioactive substance for therapeutic purposes at an activity differing by more than 15 per cent of that prescribed.
  - c) administration of a therapeutic dose of radiation from radiation apparatus or a sealed source which differs from the prescribed treatment dose by more than 10 per cent.
  - d) the unintended administration of radiation as a result of a malfunction of radiation apparatus.
  - e) administration of a radiopharmaceutical other than as prescribed.

Note: *The definition of "accident" given in the Radiation Control Regulation identifies what is reportable to the Environment Protection Authority (EPA).*

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*The definition used in the Australian Standard is more practical and detailed for laboratory situations and is better suited for use by School Radiation Safety Supervisor's(RSS's). All accidents must be reported to the HS Unit.*

*The Radiation Safety Officer(RSO) will assess these accidents against the definition in the Radiation Control Regulation to determine if the accident is reportable to EPA.*

### 2.5 Radiation User

Any person who operates, handles or manipulates ionising radiation apparatus or radioactive substances. A user can be a licence holder or a student working under supervision of a licence holder.

### 2.6 Sealed Source

Any radioactive substance that is firmly bonded within metals or sealed in a capsule or similar container of adequate mechanical strength to prevent dispersion of the active substance into the surroundings under foreseeable conditions of use and wear

### 2.7 Unsealed source

A source which is not a sealed source and which under normal conditions of use can produce contamination

## 3. Procedure

Before any work with radiation is undertaken, the licence holder with the assistance of the local Radiation Safety Supervisor (RSS) and the University Radiation Safety Officer (RSO) where appropriate, should perform a [Risk Assessment and Control Form](#). Further assessments should be made if the radiation usage is to be modified.

A generic risk assessment may be made in cases where identical risk factors apply.

The Risk Assessment process should take the following format.

Hazard Identification.

Risk Assessment.

Risk Control.

### 3.1.1 Hazard Identification

Hazards from exposure to ionising radiation fall into two main categories:

- External exposure from sealed sources, unsealed sources and irradiating apparatus.
- Internal exposure resulting from ingestion, inhalation or absorption through the skin of unsealed sources.

These hazard identification factors may include:

- The nature of the potential radiation exposure based on the type and energy of the radiation source(s)
- The possibility of contamination from an unsealed source
- The type of work - including storage and waste management
- The facilities and personnel involved
- Pregnancy and radiation exposure
- Research involving planned irradiation of humans
- Research involving the administration of radiation to live animals
- Credible incident scenarios
- Any non-radiological hazards associated with the proposed work.

### 3.1.2 Risk Assessment

In the assessment of risk, the conservative assumption is made that any increase in exposure to ionising radiation causes a corresponding increase in the risk of adverse health effects.

It is further assumed that there is no threshold for this linear relationship.

Risk assessment factors to be taken into account include:

- The nature of potential external radiation exposure based on the type of the radiation source (alpha, beta, gamma, X-ray, neutron)
- The nature of potential radiation dose based on the energy of the radiation source
- Potential radiation dose based on the duration and frequency of exposure
- Any potential internal dose as a result of possible contamination
- Maximum potential radiation doses from normal operations and credible accidents
- Non-radiological hazards associated with the proposed work.

The Radiation Safety Officer (RSO) may provide advice on compiling risk assessments.

### 3.1.3 Risk Control Procedures

At UNSW the risk management approach of hazard identification, risk assessment and risk control to the management of radiation safety has been adopted. This approach is based on the radiation protection principles outlined in the International Commission of Radiological Protection's publication 60 (1990). These principles are:

1. Justification:

Any practice involving potential exposure to radiation should be undertaken only if the net benefit can be justified.

2. Optimisation:

All radiation exposures should be kept as low as reasonably achievable (ALARA), economic and social factors being taken into account.

3. Limitation:

In no case should the relevant dose limits be exceeded. These dose limits are given in Schedule 2 of the Radiation Control Regulation, 2003.

### 3.1.4 Risk Control Methods

Where a risk assessment identifies a risk it shall be eliminated or minimised in the planning phase. This can be done by applying the Hierarchy of Risk Control Methods in the following order of priority:

1. Elimination – removal of the ionising radiation risk entirely (eg fluorescence methods can sometimes replace auto-radiography)
2. Substitution – use of a less hazardous radionuclide (eg P-33 can replace P-32)
3. Isolation – containment of the hazard (eg special remote operation facilities)
4. Engineering controls – (eg shielding, interlocks, glove box)
5. Administrative procedures – (eg licensing, record keeping, standard operating procedures)
6. Personal protective equipment (eg dedicated laboratory coat, gloves, eye protection)

## 3.2 Radiation Safety Administrative Procedures

### 3.2.1 Licencing and Registration

### 3.2.1.1 UNSW Licence to Sell /Possess

The University of New South Wales is required by EPA to register every 3 years to sell/possess ionising radiation.

### 3.2.1.2 Ionising Radiation Premises Registration

All Schools using unsealed sources are required by EPA to register laboratories as [“premises on which a radioactive substance that is not contained in a sealed source device is kept or used”](#) bi-annually. Inspection of premises is to be arranged in consultation with the Radiation Safety Officer(RSO). All premises should have a radiation safety manual, though this is only mandatory if requested in writing by the Director of EPA.

The occupier must notify the EPA within 14 days in writing of any change to the following information:

- the registered office address of the occupier,
- the delegated person contact details provided on the application for the registration or renewal, and
- the site contact person details provided on the application for registration or renewal.

Note: Laboratories using unsealed sources which have a total activity less than prescribed in [Schedule 1 of Radiation Control. Regulations 2003](#) should have a label on the external door describing this condition. Laboratories using sub licenceable activities of ionising radiation are still required to comply with AS 2243.4 Safety in Laboratories -Ionizing Radiation

#### 3.2.1.2.1 Compliance by Occupiers of Registered Premises

3.2.1.2.1.1 The occupier must ensure that a radioactive source that is kept or used on the premises is only used by a person who is appropriately licensed under section 6 of the Act or is exempt from licensing requirements and has approval under clause 8 of the Regulation.

3.2.1.2.1.2 The occupier must ensure that no person is exposed to ionising radiation from a radioactive source that is kept or used on the premises in excess of the limits in Schedule 2 of the Regulation.

3.2.1.2.1.3 The occupier must ensure that any person who uses a radioactive source that is kept or used on the premises is made aware of:

- 1) the hazards that can arise in connection with the use of a radioactive source,
- 2) the procedures relating to the safe use of a radioactive source,
- 3) the procedures to be followed in the event of a radiation incident, and
- 4) the name of the radiation safety officer or other person to whom the user should refer in connection with any matters relating to the safe use of a radioactive source

3.2.1.2.1.4 The occupier must ensure a radiation warning sign in the form prescribed in Schedule 5 of the Regulation is displayed in the immediate vicinity of the entrance to the premises and in each room comprising the premises.

3.2.1.2.1.5 The occupier must ensure that a notice is displayed adjacent to the radiation warning sign at the entrance to the premises that includes the following information:

- the name of the occupier
- the premises EPA registration number
- the premises registration expiry date
- the name and telephone number of the person to contact in the event of an emergency affecting the premises, and
- the emergency service and telephone number to call in the event of an emergency affecting the premises.

3.2.1.2.1.6 The occupier must ensure that a summary of the procedures relating to the safe use of a radioactive source is displayed at the premises, or in each room comprising the premises, and detailed procedures to be followed in the event of a radiation accident are kept at the premises.

### 3.2.1.3 Sealed Source Devices

All Schools are required by EPA to register sealed source devices eg moisture detectors (with neutron sources)

### 3.2.1.4 Ionising radiation User licences

All staff and visitors using ionising radiation shall have the appropriate radiation licence. An EPA ionising radiation users licence is required for staff using:

- radioactive materials which exceed the activities described in Schedule 1 of the Radiation Control Act 1990.
- XRD equipment, X-ray cabinet equipment, Computerised Tomography(CT) and Positron Emission Tomography(PET) equipment which do not comply with, NHMRC “Code of Practice for protection against ionising radiation emitted from X-ray analysis equipment (1984)” and/or “Statement on cabinet X-ray equipment for examination of letters, packages, baggage, freight and other articles for security, quality control and other purposes (1987)”
- XRF equipment which do not comply with, NHMRC “Code of Practice for protection against ionising radiation emitted from X-ray analysis equipment (1984)”

Students exempted from licensing conditions shall be under the supervision of an appropriately licensed supervisor. Their exemption from licensing requirements shall:

- be in writing
- identify the supervisor
- identify the person(s) supervised
- be signed by supervisor and person(s) supervised
- specify the details of their work with radiation apparatus or radioactive materials
- set out any conditions to be fulfilled.

Laboratories where persons exempted from personal licencing work with ionising radiation shall have an exemption list displayed.

### 3.2.1.5 Uranium/Thorium permit

The Australian Safeguards and Non-Proliferation Office (ASNO) requires UNSW to provide details annually of the quantities of uranium/ thorium stored for research purposes. All Schools who use /store uranium or thorium salts are required to maintain an inventory and provide RSO with updates of usage for incorporation into an annual report to ASNO. Inventory forms are available from RSO (x52912).

## 3.3 Safe Work Procedures(SWP's)

For all work involving the use of radiation, the appropriate licence holder should write [Safe Work Procedures\(SWP's\)](#).

The task should be divided into a logical sequence of work steps or events, with due consideration given to the risk assessment to ensure the risk associated with that work step or event has had the hierarchy of hazard controls applied to eliminate or reduce the risk.

SWP's should be approved by the School Radiation Safety Supervisors (RSS's) prior to the commencement of research and be issued to all appropriate staff and students.

Issues that should be addressed in the procedures include:

- Methods to reduce personal exposure (time, distance, shielding, contamination control)
- Personal dose monitoring
- Use of personal protective equipment and safety devices
- Labeling and warning signs

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- No consumption or storage of food and drink in radiation areas
- Emergency procedures.

### 3.4 Project/ program approval form

Researchers using ionising radiation must submit a [Project/ program](#) approval form to the Radiation Safety Committee (RSC), with the appropriate protocol documentation, for their approval before any new research work involving radiation is undertaken. This gives researchers the authority to use UNSW's Radiation Licence to 'possess' radioactive substances.

### 3.5 Registers

Laboratory Managers or School RSS's shall maintain the following registers, where appropriate:

1. [Register of radiation users \(EPA \) licenced staff and students\)](#)
2. [Register of radiation researchers, laboratories and research projects](#)
3. Record/Register of personal radiation monitor users
4. Register of projects and associated risk assessments
5. Register of unsealed radioactive sources, purchase, use and waste disposal
6. Register of sealed radioactive sources, purchase, use and disposal
7. Register of radiation apparatus purchase and disposal
8. Results of surveys of contamination monitoring /radiation apparatus
9. Register of EPA registered radiation premises within the School
10. Register of students exempted from licencing for the use of ionising radiation
11. Registers of accidents and incidents involving radiation
12. Radiation safety training register.

Linked templates are designed to allow researchers to have base documents for recording their radiation management system. Templates should be adjusted to suit the system used by each School /Department/unit. eg purchase template in an unsealed radioisotope laboratory could be the used to cover all radioactive material flow in laboratories including wipe surveys.

### 3.6 Radiation Monitoring

#### 3.6.1 Personal Radiation Monitoring

All persons working with and potentially exposed to penetrating radiation are to use an appropriate personal monitoring device which records [ionising radiation dose exposure](#). Arrangements to obtain personal dosimeters are to be made with the Radiation Health & Safety Coordinator via the School or Departmental Radiation Safety Supervisor. Exemptions may be made for students performing specifically defined experimental work. Thermo luminescent dosimeters (TLD's) issued to users of high energy beta and gamma emitters are sent to an external consultant for processing periodically (monthly for finger TLD's and 3 monthly for chest TLD's) via HS Unit .

Personal dose records are maintained by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and by the UNSW HS Unit. The results are available to individuals on request. A record of individual cumulative radiation dose are required to be provided by local Schools on termination of employment at the University.

Biological monitoring to determine any internal uptake of radioactive iodine or tritium is recommended for persons using activities greater than 10 times the Annual Limit on Intake (given in AS2243.4 Safety in Laboratories. Ionizing Radiation). Arrangements can be made with the Radiation Safety Officer(RSO) for biological monitoring.

### 3.6.2 Area Radiation Monitoring

Routine workplace monitoring is part of normal operations. In addition, laboratory managers shall ensure that laboratories where unsealed sources are kept or used are monitored at monthly intervals and records are kept.

### 3.6.3 Monitoring of Radiation Apparatus

The user of each X-ray analysis unit shall ensure that regular radiation monitoring of the unit is carried out to detect unintended radiation emissions and to assist in preventing such emissions.

## 3.7 Purchasing Procedures

Purchases of radioactive materials or radiation apparatus should be authorised by the School Radiation Safety Supervisor before an order is placed. Requisitions should include the licence number of the responsible person and UNSW's Radiation Licence number, which allows the purchaser to 'possess' the radioactive substance or apparatus. The laboratory manager shall keep records of all purchase receipts. Students are not permitted to order radioactive materials; these orders must be replaced by their responsible supervisor.

Radioactive sources (type A packaging) must be delivered to the responsible person or designated representative within the School.

"The occupier must notify the EPA within 7 days if a sealed radioactive source that exceeds "threshold activities for sealed radioactive sources" in the Schedule attached to premises registration conditions, is received at the premises or removed from the premises.

The occupier must include information as described in clause 3.5 of the premises registration conditions (link):

- a description of the sealed radioactive source,
- the serial number of the source,
- the date the sealed radioactive source was last assayed and its activity at assay,
- the person who last assayed the sealed radioactive source (and whether it was the supplier or the occupier)
- the date the sealed radioactive source was received at the premises and the supplier (if the occupier is reporting that a sealed radioactive source has been removed, as required by condition (Appendix D clause 3.3), and the details of the inconsistency and the reason for the inconsistency (if the occupier is reporting an inconsistency, as required by condition Appendix D clause 3.4)."

## 3.8 Security

When not in use, radioactive substances shall be kept in a suitable locked store, separate from non-radioactive substances.

Access to designated radiation areas shall be restricted to authorised personnel. Radiation stores considered to be high risk will be alarmed back to base (UNSW Security).

## 3.9 Waste Management

The occupier must not dispose of the radioactive source without the written consent of the Director- General in accordance with the clause 23 of the Regulation.

Materials classified as radioactive cannot be removed from UNSW. Each School or Department shall ensure that radioactive wastes are managed effectively.

## 2

Waste radioactive material requiring either a long or medium term storage shall be kept in the University's radiation store. The store shall be under the control of the University Radiation Safety Officer (RSO) who will be responsible for maintaining the inventory logbook. Radioactive waste can be transferred to UNSW radiation store by faxing OHS Unit (x52365) and arranging an appropriate time with RSO. Waste continues to be the property of the sourcing School whilst in the UNSW radiation store.

When UNSW staff and students are working in organisations external to UNSW campuses they should follow the documented procedures of those organisations for ionising radiation waste management, by agreement, with the local radiation safety supervisor

Waste containing activities of ionising emitting radiation less than described in schedule 1 of Radiation Control Regulations ("sub licenceable") can be removed by approved UNSW hazardous waste contractor using a [Waste Disposal Form - Chemical - UNSW](#) and [Waste Declaration Form - < Radioactive activity](#)

The waste contractor receiving UNSW waste requests involving waste with "sub licenceable" activities should:

- Have attended training at contractor headquarters to enable sufficient understanding of procedures related to decayed radiation waste.
- Be familiar with waste requirements for disposal of materials of radioactive materials origin( See assessment, Classification & Management of Liquid & Non –liquid wastes, Section 3.5 –Classification of wastes containing radioactive substances)
- Not remove any waste labeled with radioactive trefoil and /or Caution Radiation. UNSW staff MUST first have ensured that radiation levels are not above background prior to removing such labels.
- Remove waste only from designated areas as per waste request form.
- Ensure decayed radioactive materials are monitored with a portable radiation detector prior to removal to ensure activity levels are not above background. This is expected to be in the contractors risk assessment for collection and disposal of waste. Monitoring may be by arrangement with local staff equipment. It is important that both UNSW staff and contractor are agreed that the waste is at ionising radiation background levels.

Note: This does not apply to radioisotopes unable to be detected by portable detectors (eg tritium).

### 3.9.1 Radiation apparatus

Before disposal of radiation apparatus, it shall be rendered inoperative and all radiation warning signs removed. The electronic components must be disposed of separately to the x-ray tube. Notification shall be given to the Radiation Health & Safety Coordinator of its disposal.

### 3.9.2 Sealed sources

Sealed radioactive sources that are surplus to requirements should be returned to the manufacturer where possible. Interim storage may be arranged with the Radiation Health & Safety Coordinator.

### 3.9.3 Non-liquid Waste

The process of radioactive decay will permit short half-life substances to be disposed of according to their chemical or physical characteristics when their activity is below that [defining a radioactive substance](#) .

(More details of the classification of radioactive wastes are given in the EPA Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes. This gives the criteria for waste classification.)

## 2

All material shall be stored until decay permits disposal (as above). Stored material shall be appropriately packaged, labeled and documented.

### 3.9.4 Liquid Waste

Only liquid waste which results in radiation levels no greater than background activity may be disposed of to the sewage system. Other liquid waste shall be treated as in 4.4.9.3. (Also refer to the EPA Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes, for detail of disposal classifications.)

### 3.9.5 Scintillant Waste

Our waste disposal contractor is able to accept this particular type of mixed liquid and solid waste material provided the level of radioactivity is below **100 Bq per gm** (2.7  $\mu\text{Ci}$  per kg).

- Collect sealed vials into a metal or fiberboard drum (available from contractor via chemical waste disposal form faxed to OHS Unit) which has been lined with a strong plastic bag.
- Seal the inner liner.
- Seal the drum.
- Label the drum with:-
  - your name
  - your laboratory
  - a description of the contents
  - the radionuclide
  - the activity
  - the date
- Fax a signed "chemical waste disposal form" including the above information and a "Waste declaration form –radioactive" to OHS Unit (x52365) .

An inventory of all activity added to waste containers must be maintained to ensure that the activity limit of 100 Bq/gm is not exceeded.

(These are usually measured quantities and should not be difficult to add up)

Where total activity may exceed the limit, there are a number of alternatives:

- For short half life radionuclide's, decay in storage until appropriate levels are reached.
- For long half life radionuclide's, it may be possible to mix differing levels of waste activities to ensure that the total remains below 100 Bq/gm.

Note : Do not mix different radionuclide's

- If this is not possible, carefully decant **only the high level scintillation liquid** into a suitable vessel for long term storage. Label this as above and send a signed "Request for disposal of Contaminated Waste" form to OHS Unit.

### 3.10 Training

Training is required by the following persons:

- New staff and students working with radiation or in laboratories where radiation is used
- Radiation workers who have not received previous training at UNSW
- Radiation workers who require additional specialised training
- Radiation Safety Supervisors.

The aims of the ionising radiation safety training program are to ensure that participants have the knowledge to work safely with radioactive substances or ionising emitting radiation apparatus and to comply with legislative requirements.

After undergoing the appropriate level of training, objectives for specific groups are:

**3.10.1 New staff and students** and others who have received UNSW training will be able to:

- Distinguish the type of hazard associated with different radionuclides or radiation apparatus
- Use appropriate methods to reduce their dose to as low as reasonably achievable
- Comply with NSW regulations and local rules relevant to work with radiation
- Dispose of radioactive waste safely.

**3.10.2 Workers requiring specialised training** will be able to:

- Safely undertake specific specialised work
- Minimise associated radiological hazards.

*Radiation Safety Supervisors (RSS's)* will be able to:

- Advise colleagues on School or Departmental radiological safety matters
- Develop and approve standard operating procedures for radiation work
- Maintain registers as required in Section 4.4.5
- Co-ordinate the distribution and collection of personal radiation dosimeters.

### **3.11 Inspection**

The Head of School or the Radiation Safety Officer will need to undertake regular inspection of laboratories where radioactive substances or radiation apparatus is being used, to ensure that safe work practices are being followed.

### **3.12 Transport of radioactive substances**

All transport of radioactive substances shall conform to the Commonwealth Code of Practice for the Safe Transport of Radioactive Material, 2008.

Such transport shall be arranged in consultation with the Radiation Safety Officer.

### **3.13 Reporting of incidents/accidents involving radiation**

Every radiological accident (as defined by AS 2243.4 in Section 1.4) and incident shall be reported immediately to the Radiation Safety Officer via the Laboratory Manager or Radiation Safety Supervisors as appropriate. Incident/accidents must be reported on UNSW incident online reporting at myUNSW along with "OHS005 Radiation Incident Report Supplementary Information Form" located at [http://www.ohs.unsw.edu.au/ohs\\_forms\\_checklists/index.html](http://www.ohs.unsw.edu.au/ohs_forms_checklists/index.html) Accidents shall also be reported to the EPA section of DECCW as required by the NSW Radiation Control Regulation, 2003, Reg 27 (1), if the requirements of Reg 26 are exceeded.

### **3.14 Emergency procedures**

Written emergency procedures based on the risk assessment results shall be available in each laboratory where radiation is used.

### **3.15 Pregnancy and work with ionising radiation**

The Radiation Control Regulation 2003 prescribes specific dose limits for pregnant **women**. Women notifying their Head of School or RSS of their pregnancy may continue working with radiation provided work practices are reviewed to ensure these dose limits are not exceeded. Consideration will be given to the assessment of personal doses at more frequent intervals than usual.

### **3.16 Decommissioning Laboratories**

When a radiation laboratory is to be decommissioned the licensee must sign a statutory declaration that all areas of the laboratory where radiation work was carried out that all areas used during radiation work have been monitored/swabbed and that there is no recordable levels of contamination. If any areas of contamination are detected the laboratory must not be classified as decommissioned until all measurable levels of contamination and all radiation labels have been removed. An inspection certification report should be maintained in the records of the laboratory decommissioned for the use of ionising radiation.

### 3.17 Maintenance and Records of Monitoring Devices

All devices used for the detection of ionising radiation and measuring in counts per second(cps) or counts per minute(cpm) shall be checked , maintained and tested in accordance with UNSW Reliability Testing Procedure for Ionising Radiation Detectors OHS436 [Reliability Testing Procedure for Ionising Radiation Detectors](#)

Devices used for radiation monitoring ( $\mu\text{Sv/hr}$ ) shall be checked, maintained and calibrated in accordance with the Radiation Advisory Council document "Guideline: Monitoring Devices". <http://www.environment.nsw.gov.au/resources/radiation/devices.pdf>

A record for each detection and monitoring device shall be kept by the section manager and contain the:

- date the device was acquired
- date and details of repairs; and date of calibration/testing.

### 3.18 Reporting for Registered Premises(Unsealed Sources)

- 3.18.1 The occupier must ensure that a summary of the procedures relating to the safe use of a radioactive source is **displayed** at the premises, or in each room comprising the premises, and detailed procedures to be followed in the event of a radiation accident are kept at the premises.
- 3.18.2 The occupier must notify the EPA of the loss or theft of a radioactive source that is kept or used on the premises, according to the requirements in clause 33 of the Regulation.
- 3.18.3 The occupier must notify the EPA within seven (7) days if a sealed radioactive source that exceeds the "threshold activities for sealed radioactive sources" in the Schedule attached to these conditions is received at the premises or removed from the premises.
- 3.18.4 The occupier must carry out an annual stock take of radioactive sources kept or used on the premises, and must notify the EPA within seven (7) days if a stock take shows an inconsistency in number or details relating to sealed radioactive sources that are kept or used on the premises that exceed the "threshold activities for sealed radioactive sources" in the Schedule to those conditions.
- 3.18.5 The occupier must include the following information in any notification required by 3.3 and 3.4:
  - a description of the sealed radioactive source,
  - the serial number of the source,
  - the date the sealed radioactive source was last assayed and its activity at assay,
  - the person who last assayed the sealed radioactive source (and whether it was the supplier or the occupier)
  - the date the sealed radioactive source was received at the premises' and the supplier (if the occupier is reporting that a sealed radioactive source has been removed, as required by

condition 3.3), and the details of the inconsistency and the reason for the inconsistency (if the occupier is reporting an inconsistency, as required by condition 3.4).

- 3.18.6 The occupier must comply with any written notice from the EPA requiring the occupier to furnish the EPA with such information relating to this registration as is specified in the notice and by the time specified in the notice.
- 3.18.7 The occupier must address any notification or report required by these conditions or the Act or the Regulation to the Director Radiation Control, EPA, PO Box A290, Sydney South, 1232 or email: [radiation@epa.nsw.gov.au](mailto:radiation@epa.nsw.gov.au).
- 3.18.8 The occupier must notify the EPA within 14 days in writing of any change to the following information:
- the registered office address of the occupier,
  - the delegated person contact details provided on the application for the registration or renewal, and
  - the site contact person details provided on the application for registration or renewal.

### 3.19 Premises Security compliance

- 3.19.1 The occupier must comply with the obligations of a 'responsible person' in the Code of Practice for the Security of Radioactive sources (Security Code, as published by the Australian Radiation Protection and Nuclear Safety Agency(ARPANSA) from time to time.'
- 3.19.2 The occupier must complete the source categorisation referred to in section 2.1 of the Security Code and notify the EPA in writing if they are in possession of a security enhanced source, namely a source or aggregation of sources categorised at level 1,2 or 3 according to the Security Code , and include the following details
- 3.19.3 The occupier must notify the EPA in writing within 7 each time a new security enhanced source is replaced or removed from the premises . This notification must include the date the source was removed , the reason it was removed , and the place to which it was removed, the reason it was removed and the place to which it was removed.
- 3.19.4 The occupier , if responsible for a security enhanced source , must prepare a source security plan in accordance plan in accordance with section 2.1.3 of the security code that demonstrates how the licensee will satisfy the requirements of the Code in relation to the source and includes the information described in paragraph A.1 of Schedule A of the Security Code.
- 3.19.5 The occupier must comply with the provisions of Chapter 7 of the Security Code in relation to security enhanced and non-security enhanced sources . In addition to the incident report referred to in Chapter 7.1.2 of the Security Code , the occupier must make an initial report to the EPA as soon as possible , but in any event , no later than 3 days after the becomes aware of the breach.
- 3.19.6 Notwithstanding the obligations referred to above :
- (a) The Security Code requirements relating to approval of security plans and transport security plans by an assessor accredited by the regulatory authority are suspended until their commencement is notified by the EPA.
  - (b) B The security Code requirements relating to obtaining security background checks (in accordance with Schedule E2) are suspended until their commencement is notified by the EPA. Where the Security Code refers to obtaining a security background check, occupiers must substitute an identification check (in accordance with Schedule E1 of the Security Code).

Notes : (i) For non –security enhanced sources , the only applicable requirements of the Security Code are those detailed in Chapter 7 .

(ii) The Security Code applies to radioactive sources in the form of a sealed radioactive source only.

### 3.20 Storage

3.20.1 The occupier must ensure any radioactive source that is not required for immediate use is securely stored.

3.20.2 The occupier must ensure that:

- a store, or storage area for radioactive sources within the premises is constructed of durable materials, is lockable and source and secure,
- radioactive sources are not stored with explosives, combustible or corrosive materials,
- the radiation level in any accessible region outside the store or storage area does not cause the dose limits in Schedule 2 of the Regulation to be exceeded, and the store or storage area bears a radiation warning sign in the form prescribed in Schedule 5 of the Regulation.

## 4. Review & History

### Appendix A: History

The authorisation and amendment history for this document must be listed in the following table. Refer to information about [Version Control](#) on the Policy website.

Version	Authorised by	Approval Date	Effective Date	Sections modified
1	DVC (Research and International)	January 2001	1 February 2001	
2	HR Director	December 2006	1 January 2007	5 6 Appendix B.E
3	HR Director	June 2008	1 July 2008	All
4	HR Director	March 2011	1 April 2011	All
4.1	HR Director	22 August 2011	22 August 2011	3.2.1.5
4.2	HR Director	September 2012	4 January 2013	3.2.1.2 –New section – 3.9 Update 3.18 Occupier compliance 3.19 Security compliance

## APPENDIX B RADIATION LICENCES. REQUIREMENTS & APPLICATION PROCEDURES.

### Statutory requirements

The NSW Radiation Control Act, 1990 requires that any person using radioactive substances or irradiating apparatus must hold a licence. Students are exempt from licensing but only if they have approval from an appropriate licence holder.

Detailed information relating to exemptions can be obtained from the Radiation Health & Safety Co-ordinator and are given in clause 8 of the Radiation Control Regulation.

### **Responsibility**

It is the responsibility of each staff member to apply for and maintain a radiation licence if they use radioactive substances or irradiating apparatus.

### **Procedure**

To obtain a licence a person must apply to the Department of Environment ,Climate Change and Water(DECCW) on the prescribed form. The application forms covering radioactive substances and irradiating apparatus available at DECC web site .

<http://www.environment.nsw.gov.au/radiation/formdownload.htm>

The most important detail to be supplied by the applicant is a certificate of training that they have undertaken, since this is a major consideration in the approval process, particularly for the scientific and research licence type. Other important details are the type of licence being applied for (eg type 8 for scientific and research purposes), the maximum activity of radionuclide or the type of apparatus to be used, the occupation category and employer classification. This information is available at DECCW web site.

All qualifications need to be witnessed by a JP.

Licence applications are processed on a monthly basis by DECCW. If an application has insufficient information then the approval will take another month pending the supply of the requested information.

### **Renewal Procedure**

Radiation licences are issued for one year. The Environment Protection Authority(EPA) part of the Department of Environment Climate Change and Water(DECCW), sends a renewal notice approximately one month prior to the expiry date, with a reminder two weeks later. If payment is not received by the Department of Environment and Climate Change (DECCW), by the expiry date, the licence lapses and a new licence application with the full fee is required.

Please note that licence lapses by radiation workers who obtained their initial training prior to assessment based training may be required to attend a currently approved radiation safety training course.