Radiation Research Procedure

Version	Approved by	Approval date	Effective date
3.1	Director of Governance	16 April 2025	16 April 2025

Procedure Statement		
Purpose	This procedure sets out the responsibilities and authorities governing the use of ionising and non-ionising radiation in research in NSW and the ACT in accordance with the requirements of the relevant legislation, including the Protection from Harmful Radiation Act No 13, the Protection from Harmful Radiation Regulation 2013, the ACT Radiation Protection Act 2006 and ACT Radiation Protection Regulation 2007.	
Scope	The content of the document applies to all staff, students and visitors at UNSW Sydney and Canberra and affiliated centres and institutes involved in research using ionising and non-ionising radiation.	
Are Local Documents on this subject permitted?	☒ Yes, however Local Documents must be consistent with this University-wide Document	☐ No
Procedure Processes and Actions		

Contents

1. Preamble

As a major research and teaching establishment in Australia, the University uses a range of ionising and non-ionising radiation in Schools throughout its campuses. At UNSW Sydney and Canberra, the risks involving the use of ionising and non-ionising radiation are evaluated by the respective University Radiation Safety Committees (RSCs) according to Federal and State legislative requirements and

ensuring that the reduction of possible harm to the health and safety of people and the environment through radiation is at the core of research activities.

2. Regulatory Environment

UNSW Sydney holds a Radiation Management Licence (RML) with the NSW Environmental Protection Authority (EPA) while UNSW Canberra holds a Possession Licence (PL) with the Health Protection Service, ACT Health in accordance with the respective NSW and ACT Acts. The Licences details the authorisations for the University, including to possess and store regulated materials. The Vice-Chancellor, as Head of the Establishment, has delegated the Deputy Vice-Chancellor Research & Enterprise and Pro Vice-Chancellor (Research), with the support of the respective Presiding Member and Chair for Radiation Safety, the RSCs and its Radiation Safety Officers and Research Ethics and Compliance Support (RECS) to oversee the use of regulated materials in research at UNSW.

All regulated materials are inspected by the responsible RSC and registered under the applicable University's Licence. Any proposed changes to registrations, such as decommissioning or transfer of regulated materials to another Licence holder, are reviewed by the responsible RSC and approved by the DVCRE or PVC(R) so that notification can be made to the relevant Regulator.

UNSW holds permits from the Australian Safeguards and Non-proliferation Office (ASNO) to possess nuclear material for research and storage purposes in compliance with Australia's obligations under its nuclear safeguards agreements with the International Atomic Energy Agency (IAEA). The University reports to ASNO annually on the inventory of nuclear material across its campuses.

Although the NSW *Act* includes "non-ionising radiation apparatus of a kind prescribed by the regulations" into the definition of regulated materials, the NSW Environment Protection Authority exclude these apparatus from their regulatory framework. For UNSW purposes, the *Australian Radiation Protection and Nuclear Safety Regulations 2018* (Cth) and its associated Radiation Protection Series will be referenced for best practice.

All lasers which fit the description of a controlled apparatus by the *Australian Radiation Protection and Nuclear Safety Regulations 2018* (Cth) are reviewed and approved by the relevant RSC prior to commissioning. All laboratories where these lasers are located are registered with the relevant RSC as laser laboratories.

3. Principles of Radiation Research Safety at UNSW

The University recognises the risks posed by the use of radiation in research and their potential harmful consequences to people and the environment as a result of exposure to ionising and harmful non-ionising radiation. The framework for radiation safety at UNSW is based on the radiation protection principles outlined in the relevant Acts and Regulations to maintain all radiation exposures as low as reasonably achievable (ALARA). The principles are: a) justification: any activity involving potential exposure to radiation should be undertaken only if the net benefit can be justified, b) optimisation: all radiation exposures should be kept as low as reasonably achievable taking into account economic and social factors, and c) limitation: in no case should the dose limits as set out by the Regulations be exceeded.

4. University Radiation Safety Committees

4.1. RSC Terms of Reference

There are two Radiation Safety Committees at UNSW, the UNSW Sydney RSC and the UNSW Canberra RSC. The composition, terms of reference, functions and responsibilities of the UNSW RSCs have been established to conform with the requirements of the relevant legislation.

While the RSCs function independently, the Chairs are expected to provide advice collectively on matters relating to whole institutional policy.

The RSCs shall act in relation to:

- UNSW and its affiliated organisations including those for which Affiliation Agreements are in force with respect to matters of radiation safety and the role of the RSC.
- All research, teaching or other activity that involves the use of radiation as defined under the relevant Act, Regulations and Standards.

The UNSW RSCs are accountable to the governing body of the UNSW, the Council, through the DVCRE or PVC(R), and the Vice-Chancellor.

The Presiding Member and Chair of the UNSW RSCs will meet annually, or more frequently as required, with the DVCRE or PVC(R) to consider institutional issues relating to radiation safety matters.

The UNSW RSCs operate according to the following terms of reference to:

- assess and determine approval or rejection of research projects, laboratories or teaching courses involving the use of ionising or non-ionising radiation, radioactive substances or lasers and ensure that each proposal:
  - is subject to a safety assessment based on the radiation protection principles of justification, optimisation and limitation;
  - is conducted in facilities with appropriate level of shielding, engineering and administrative controls to protect the health and safety of all persons involved;
  - fulfils all regulatory requirements and is subjected to any necessary pre-operational tests before its commencement; and
  - incorporates appropriate training for staff, students and visitors prior to work on the proposal.
- conduct follow-up review of approved projects and activities, and recommend to the DVCRE or PVC(R) suspension, withdrawal or termination of projects and activities that do not conform to the requirements of the relevant legislation.
- review and recommend appropriate safety training for all staff and students who use ionising or non-ionising radiation, radioactive substances and lasers.
- inspect and recommend for approval or rejection to the DVCRE or PVC(R) new facilities, radiation devices and apparatus requiring registration with the relevant regulator.
- receive and consider reports from the relevant Radiation Safety Officer (RSO) and Laser Safety Officer (LSO) on:
  - monitoring results on personal radiation doses;
  - area radiation surveys of waste store;
  - annual inspections of areas where ionising radiation, radioactive substances or lasers are used; and
  - any other relevant matters concerning the uses of ionising radiation, radioactive substances, lasers and related facilities.
- provide advice to the University on the building, modification and decommissioning of radiation and laser laboratories, including installation and commissioning of radiation apparatus, sealed source devices and lasers.
- receive reports of incidents and accidents involving ionising radiation, radioactive substances or laser use through the respective RSO and LSO, including spills and unintentional exposure to radioactive material. Recommend actions for improvement or remediation, and recommend for the DVCRE or PVC(R) to report the incidents to regulatory authorities as required.
- provide advice to the Vice Chancellor of UNSW (or delegated officer) in relation to any radiation hazard generated in the course of, or relevant to, teaching, research or other activity within UNSW or its affiliated organisations.
- take appropriate actions regarding non-compliances involving radiation safety, including providing specialist advice on the safety of the radiation environment. Where there is a breach of the Code of Conduct and Values or the Australian Code for the Responsible Conduct of Research, the Conduct & Integrity Office will be informed. Where deemed appropriate, the RSC will provide advice to the DVCRE or PVC(R) as to whether any research or teaching activity involving the use of ionising or non-ionising radiation should be withdrawn, suspended or terminated.
- review and provide advice to the DVCRE or PVC(R) on draft and existing institutional radiation safety procedures and its guidelines to ensure radiation doses to staff, students and members of the public are as low as reasonably achievable.
- support the University's licence holder in reporting the inventory of nuclear material to the ASNO as required.
- report on a regular basis to the DVCRE or PVC(R) and annually to University Council on its activities and compliance with its terms of reference.

4.2. RSC Membership and Appointment

The UNSW RSCs have a membership that allows them to fulfil its terms of reference, and has the collective expertise to competently assess and provide advice on the work undertaken by the University and its affiliated organisations. Roles and responsibilities may be combined in the same person where appropriate.

All Committee members are formally appointed by the DVCRE or PVC(R). Membership is for a three year term, with the possibility to renew for additional terms as decided by the DVCRE or PVC(R). The DVCRE or PVC(R) nominates a Deputy Presiding Member from the RSC membership. The Deputy Presiding Member will act in Presiding Member's absence or where the Presiding Member has a conflict of interest. The Committee may make recommendations to the DVCRE or PVC(R) regarding the continuation or recruitment of members.

Memberships may be terminated by the DVCRE or PVC(R) at any time by providing no less than 24-hour notice in writing. Members may voluntarily retire during their appointment by providing no less than 24-hour notice in writing to the DVCRE or PVCR(R).

All members are appropriately indemnified under UNSW's general insurance program.

Each RSC is composed of the following membership:

- The **Presiding Member or Chair** as senior member of the RSC.
- **Persons** who have the combined expertise in the research disciplines in ionising radiation, radioactive substances and lasers and who represent each School or Faculty using these radiation sources. At each meeting, there must be sufficient representation from relevant research disciplines.
- The **Radiation Safety Officer** as advisor on radiation safety practice and compliance with regulatory requirements**.**
- The **Laser Safety Officer** as advisor on laser radiation safety practice and compliance with regulatory requirements**.**
- The **Deputy Rector** of UNSW Canberra (only applicable for the UNSW Canberra RSC).

4.3. Conflicts of Interest

The following arrangements are in place to deal with conflicts or potential conflicts of interest:

- Members declare, at the earliest opportunity to the Chair or Presiding Member or Deputy, any potential conflict of interest in any matter that is presented to the RSC for assessment.
- All declarations of conflict of interest are recorded in the minutes of the meeting at which the declaration is made.
- The member who has declared a conflict of interest is excluded from the deliberations and assessment of the matter by the RSC.
- If there are insufficient members available with relevant qualifications and experience, the final recommendation for a proposal is postponed until the views of additional members have been sought or until the next meeting of the RSC.

4.4. Attendance at Meetings and Decision-Making

Members are selected onto the RSC due to their relevant expertise and as such, must be present at meetings of the RSC where their expertise is required in respect of assessments of a particular proposal. If members cannot attend meetings where their expertise is required, they are invited to comment on items in writing for consideration by the RSC at its meeting. The Presiding Member or Chair may deputise an RSC Member to act as Chair in his or her absence.

The RSC may co-opt and invite non-members to meetings to provide expert advice outside the scope of knowledge of the Committee. Such invitees will not vote in any decisions of the RSC.

The decisions by the RSC are made by consensus as recommendations to the DVCRE or PVC(R) at quorate meetings, where quorum consists of at least 50% of members present or having provided their comments in writing for consideration at the meeting. Out of session decisions are ratified at the next quorate meeting.

5. Radiation Safety Officer

As an *ex officio* member of the RSC, the UNSW Radiation Safety Officer (RSO) advises the RSC and the University's researchers on health and safety regulations as relevant to the use of radiation. The RSO provides specialist strategic advice to the RSC on how to minimise risks of radiation use in research to human health and the environment and is a point of contact in emergencies where there is danger to humans or the environment.

The RSO ensures that University health and safety processes are recognised, integrated and followed in RSC processes. The RSO works with the RSC to provide appropriate training as required by the Regulator and ensures that training needs are integrated with general radiation safety requirements. The DVCR or PVC(R) will nominate an appropriately qualified member of staff as the Radiation Safety Officer for the purpose of this policy.

6. Laser Safety Officer

As an *ex officio* member of the RSC, the UNSW Laser Safety Officer (LSO) advises the RSC and the University's researchers on health and safety regulations as relevant to the use of lasers. The LSO provides specialist strategic advice to the RSC on how to minimise risks of laser use in research to human health and the environment and is a point of contact in emergencies where there is danger to humans or the environment.

The LSO ensures that University health and safety processes are recognised, integrated, and followed in RSC processes. The LSO works with the RSC to provide appropriate training as required by relevant Australian Standards and ensures that training needs are integrated with general laser safety requirements. The DVCR or PVC(R) will nominate an appropriately qualified member of staff as the Laser Safety Officer for the purpose of this policy.

7. Regulated Materials Registration and Inspection

Custodians are responsible to ensure all their regulated materials are registered with the Regulator under the University's Licence. The University Licence should be held by the most appropriate authority in alignment with the UNSW Delegations. The RSC is responsible for inspecting and recommending regulated materials for registration.

The threshold for a radioactive substance as defined in the legislation is 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 40MBq for radionuclides in Group 1, 2, 3 or 4 respectively, as defined in the Protection from Harmful Radiation Regulation 2013 and ACT Radiation Protection Regulation 2007). All radioactive substances intended to be used in radiation projects are to be notified to the relevant RSO. The RSO will advise if the utilisation of the material requires an application for approval by the RSC prior to commencement of work. The RSC may make instructions relating to the reporting of exempt level of material/research.

Upon successful registration, the RSC conducts annual inspections and communicates the outcome of the inspection to the custodian of the regulated materials. The custodian addresses any issues identified by the RSC as non-compliant within a specified time frame. The DVCRE or PVC(R) may suspend research at any time should the management of regulated materials be found non-compliant.

Laser laboratories and only Class 3 and 4 lasers require registration with the RSC.

7.1. Radiation Management Plan

The respective Radiation Management Plans comply with the ARPANSA Code of Practice. It outlines the security requirements to be implemented on sealed radioactive sources in order to decrease the likelihood of unauthorized access or acquisition of the radioactive sources by others with malicious intent. It is a single source document which includes the processes and related procedures that are in place to ensure effective and efficient physical protection and protective security measures are applied.

The content of the UNSW Sydney Radiation Source Security Management Plan is managed by UNSW Security Services and the Health & Safety Unit. They are responsible for ensuring the document is reviewed, in consultation with the UNSW Sydney RSC and RECS, at least annually and for significant structural or operational changes.

The UNSW Canberra Radiation Management Plan is reviewed annually by the UNSW Canberra RSO. The document is reviewed in consultation with the UNSW Canberra RSC.

8. Nuclear Safeguards and Nuclear Security requirements

UNSW hold permits from the ASNO to possess a small amount of nuclear materials, as specified within the permit. The permit is for a variety of purposes including certain fields of research, analytical services, diagnostics, education, training purposes, calibration of apparatus and storage. Any nuclear fuel cycle related research and development activities must be approved by the Director General, ASNO in writing prior to commencing work.

RECS must be notified regarding any potential international or domestic transfers of such nuclear material as it requires prior approval from ASNO and ARPANSA as applicable in accordance with their reporting timeframes and forms.

UNSW shall maintain security measures for preventing theft, loss or unauthorised handling of nuclear material and its associated records as described in the permit.

9. Research Conducted Outside of UNSW

UNSW researchers conducting research outside of UNSW (instrastate, interstate or overseas) using other institutions' regulated material do not need to seek review by the UNSW RSC. Instead, they need to ensure that appropriate registration and licencing in accordance to the State authority where the research is based are met prior to commencement of the research.

UNSW researchers intending to take UNSW-registered regulated materials outside of UNSW-registered facilities (including onsite, within NSW, interstate or overseas) must inform the relevant RSC prior to the activity. The RSC reviews that procedures are in place for the safe use of the material and that appropriate registration and licencing in accordance with the State authority where the research is based are met prior to commencement of the research.

The University reserves the right to place conditions on involvement or refuse involvement in external projects by its researchers should approved proposals not conform to the requirements of the *Act* and *Regulations*, other relevant legislations or potentially expose the University to undue risk.

10. Monitoring of Radiation Exposure and Adverse Events

Project supervisors or custodians of regulated materials and lasers are responsible to provide appropriate personal protective equipment to all persons working with and potentially exposed to penetrating radiation. They must ensure processes are implemented to monitor personal exposure, area contamination and radiation emission as identified by the RSC assessment of proposal.

Project supervisors or custodians of regulated materials are required to report unexpected adverse events to the RSO (along with submitting an incident report on SALUS) and RECS as soon as possible (within 24h of the incident/adverse event) in accordance with the emergency instructions on the UNSW Radiation Research website/SharePoint site. The University delegate may suspend or withdraw approval for research involving the use of radiation where it is reasonable to believe that continuation of the research project may compromise compliance with legislation.

Issues identified during monitoring or adverse event reporting which may involve breaches of the UNSW *Code of Conduct and Values* or *Australian Code for the Responsible Conduct of Research* are handled in accordance with the UNSW *Complaints Management and Investigations Policy*.

11. Complaints and Grievances

UNSW has established a complaints and grievances mechanism for UNSW staff, students and persons external to the university. Complaints about the conduct of research by UNSW staff, students and visitors should be directed to the Director of Research Ethics and Compliance Support (RECS) (radiationresearch@unsw.edu.au). The Conduct & Integrity Office (research.integrity@unsw.edu.au) are informed of allegations involving possible breaches of the *Australian Code for the Responsible Conduct of Research* to be reviewed in accordance with the UNSW *Code of Conduct and Values*.

Grievances about compliance review and processes by UNSW staff and students should be addressed to the Director of RECS (radiationresearch@unsw.edu.au).

12. Additional Operating Guidelines

Radiation operating guidelines in support of this Procedure, such as rulings on project proposals, waste disposal, area/personal monitoring, training framework for the safe use of radioactive materials, ionising and non-ionising radiation apparatus and lasers are approved by the UNSW RSCs and displayed in their most current form on the radiation safety website/SharePoint site.

Accountabilities	
Responsible Officer	Director, Research Ethics & Compliance Support
Policy Lead	Coordinator, Radiation Research (radiationresearch@unsw.edu.au)
Supporting Information	
Legislative Compliance	This Procedure supports the University's compliance with the following legislation: *Protection from Harmful Radiation Act 1990 No 13* *Protection from Harmful Radiation Regulation 2013* *ACT Radiation Protection Act 2006* *ACT Radiation Protection Regulation 2007* *ARPANSA Code of Practice* *Non-Proliferation Legislation Amendment Act 2003 (Cth)* *Australian Radiation Protection and Nuclear Safety Regulations 2018* (Cth)
Parent Document (Policy)	*Code of Conduct and Values* and the *Australian Code for the Responsible Conduct of Research*.
Supporting Documents	Incident reporting via SALUS Delegations Policy
Related Documents	AS/NZS 2243.4 Safety in Laboratories Part 4: Ionising Radiation AS/NZS 2243.5 Safety in Laboratories Part 5: Non-ionising Radiation AS/NZS IEC 60825.1:2014 Safety of laser products, Part 1: Equipment classification and requirements AS/NZS IEC 60825.14 Safety of Laser Products Part 14: A User's Guide AS/NZS 2982.1 Laboratory Design and Construction Part 1: General Requirements Australian Code for the Responsible Conduct of Research 2018 UNSW Sydney Radiation Management Plan UNSW Canberra Radiation Management Plan Complaints Management and Investigations Policy and Procedure
Superseded Documents	Radiation Research Safety Procedure, v2.0
File Number	2016/24358
Definitions and Acronyms	
Controlled Laser	Laser is an acronym for light amplification by stimulated emission of radiation. Lasers produce coherent intense levels of radiation from IR, visible and UV light sources. Controlled Lasers are the subset of lasers which are subjected to registration and approval with the RSC are only those fitted description of controlled apparatus in the *Australian Radiation Protection and Nuclear Safety Regulations 2018*
Ionising Radiation	Electromagnetic or particulate radiation capable of producing ions directly or indirectly in passage through matter but does not include electromagnetic radiation of a wavelength greater than 100 nanometres.

Laser	1. A laser product with an accessible emission level more than the accessible emission limit of a Class 3R laser product, as set out in Australian/New Zealand Standard AS/NZS IEC 60825.1:2014 *Safety of laser products, Part 1: Equipment classification and requirements*; or 2. An optical fibre communication system exceeding Hazard Level 3R, as defined by Australian/New Zealand Standard AS/NZS IEC 60825.2:2022 *Safety of laser products, Part 2: Safety of optical fibre communication systems (OFCS)*; and • it produces non-ionising radiation that could lead to a person being exposed to radiation levels in excess of the maximum permissible exposure limits mentioned in Australian/New Zealand Standard AS/NZS IEC 60825.1:2014 Safety of laser products, Part 1: Equipment classification and requirements; and 3. The excess levels of radiation mentioned in paragraph (b) are readily accessible to persons in the course of: a. intended operations or procedures of the apparatus; or b. under a reasonably foreseeable abnormal event involving the apparatus; or c. under a reasonably foreseeable single element failure of the apparatus; or d. without the use of tools or other specialised equipment required to remove protective barriers or access panels.
Non-ionising Radiation	Electromagnetic radiation of a wavelength greater than 100 nanometres; or non-varying electric or magnetic fields; or sonic, infrasonic or ultrasonic waves that are prescribed as non-ionising radiation for the purposes of this definition
Radiation Management Licence (RML) \ Possession Licence (PL)	An organisation responsible for regulated materials must hold a radiation management licence/ Possession Licence in respect of the regulated materials and must comply with any conditions to which the licence is subject.
Radioactive Substances	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 40MBq for radionuclides in Group 1, 2, 3 or 4 respectively).
Radiation Apparatus	A manufactured or assembled article, or any component, part or accessory of such an article, which when in operation contains or acts as part of an electrical circuit, or which acts by electromagnetic amplification employing a resonant space, and emits (or in the absence of effective shielding or other control would emit) ionising or non-ionising radiation.
Radiation Safety Committee (RSC)	Provides advice to the Vice-Chancellor of UNSW (or delegated officer) in relation to any radiation hazard generated in the course of, or relevant to, teaching, research or other activity within UNSW or its affiliated organisations.
Regulator	NSW Environment Protection Authority (EPA). (UNSW Sydney) Work Safe NSW (UNSW Sydney) Australian Capital Territory (UNSW Canberra) Health Protection Service (UNSW Canberra) ACT Radiation council (UNSW Canberra)
Regulated Materials	Radioactive substances, ionising radiation apparatus, sealed source devices and non-ionising radiation apparatus of a kind prescribed by the regulations.
Sealed Source Delivery	Equipment or a gauge, instrument or device that contains a sealed radioactive source and permits the controlled emission of radiation but does not include a container used solely for the storage or transport of a sealed radioactive source.

Revision History				
Version	**Approved by**	**Approval date**	**Effective date**	**Sections modified**
Version 1.0 of this Procedure superseded HS601 Ionising Radiation Procedure and HS711 Non-ionising Radiation Procedure				
1.0	Deputy Vice-Chancellor Research	9 August 2016	15 August 2016	New document
1.1	Deputy Vice-Chancellor Research	31 July 2017	15 August 2017	Administrative update to senior positions
2.0	Deputy Vice-Chancellor, Research & Enterprise	24 February 2021	24 February 2021	Full review leading to minor amendments
3.0	Deputy Vice-Chancellor, Research & Enterprise	30 May 2024	30 May 2024	Full review to address comments from the call for consultation published on 21st September 2023 and findings from the Radiation Waste Management Internal Audit 2022.
3.1	Director of Governance	16 April 2025	16 April 2025	Administrative update to align with Delegations