



Environment Protection Authority

Radiation Advisory Council

Annual Report 2021–22



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The Honourable James Griffin MP
Minister for Environment and Heritage

Dear Minister

It is my pleasure to forward to you for presentation to the Parliament of New South Wales the Annual Report of the Radiation Advisory Council for the period 1 July 2021 to 30 June 2022.

This report is prepared in accordance with the provisions of the *Radiation Control Act 1990*.

Karen Marler
Chairperson, Radiation Advisory Council

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Chairperson's review

The Radiation Advisory Council (the Council) provides advice to the Minister for Environment and Heritage and the NSW Environment Protection Authority (EPA) on matters in relation to the management of radiation in NSW under the *Radiation Control Act 1990* (the Act) and the Radiation Control Regulation 2013 (the Regulation).

The Council in 2021–22:

- farewelled and acknowledged the contribution and service of retiring member Ms Ingrid Klobasa (nominee Secretary Ministry of Health)
- welcomed newly appointed member Mr Thomas Greig (medical physicist position)
- welcomed re-appointed members: Dr Hugh Dixson (physician in nuclear medicine position); Dr Dion Forstner (radiation oncologist position); Dr Philip Pasfield (radiologist position) and Mr Luke Platt (diagnostic radiographer position) to the Council.

During this period the Council held five meetings and provided the EPA with advice on the administration of the Act. The Council's work during the reporting period included:

- assisting in the review of the Act and in the development of an Issues Paper for the review of the Act (see The Council's work – *Review of Radiation Control Act*)
- consideration of national uniformity matters arising from the Radiation Health Committee (RHC) and enHealth initiatives
- providing advice to the EPA on non-standard radiation licence applications
- assessment of radiation safety courses for radiation user licensing purposes
- reviewing matters arising from radiation user licences, radiation management licences and the accreditation of consulting radiation experts and security assessors
- providing advice in relation to radiation accidents and incidents reported to the EPA.

The Council's work continues to focus on its strategic objectives:

- developing uniform regulatory initiatives through the National Directory for Radiation Protection (NDRP)
- providing advice to the Minister on amendments to the Act and the remake of the Regulation
- identifying and addressing emerging issues in radiation protection, such as new technology
- identifying procedures and requirements to prevent or minimise dangers arising from the misuse of radiation sources.

In the year ahead, the Council's work will focus primarily on:

- advising on the implementation of the amendments to the Act
- advising on the remake of the Regulation
- reviewing and contributing to national codes and standards in the NDRP, and RHC and enHealth initiatives
- providing advice to the EPA on licensing, accreditation, safety courses, and radiation accidents
- reviewing the work of the Council's committees.

I would like to acknowledge the commitment and contribution made by previous and existing members of the Council, and the EPA staff who support the Council.

Karen Marler
Chairperson
Radiation Advisory Council

Composition of the Council

The Council is established under section 29 of the *Radiation Control Act 1990* (the Act). The Act and the Radiation Control Regulation 2013 (the Regulation) are administered by the Minister for Environment and Heritage through the NSW Environment Protection Authority (EPA).

The Council has 17 members appointed by the Minister. Appendix A provides the current Council membership.

Annual report

Section 33(1) of the Act requires the Council to ‘as soon as practicable after 30 June (but on or before 31 December) in each year prepare and forward to the Minister a report of its work and activities for the 12 months ending on 30 June in that year’.

Functions of the Council

Under Section 30 of the Act, the Council’s function is to advise the Minister on:

- proposed amendments to the Act and the making, amendment or repeal of regulations under the Act
- the administration of the Act and the regulations
- measures to prevent or minimise the dangers arising from radiation
- the granting of exemptions authorised by the regulations for periods exceeding 60 days, and
- such other matters relating to radiation safety as the Minister considers appropriate.

The Council may at any time, and must on the request of the EPA, provide advice to the EPA about licences and accreditations under Part 2 of the Act.

The EPA exercises responsibilities and powers under the Act, and staff of the EPA provide secretariat support to the Council.

Meetings of the Council

During the reporting period ending 30 June 2022, the Council met five times.

Strategic direction

The Council endorsed the terms of reference for a Strategic Direction Committee to review and revise the Council’s strategic direction document.

Until this review is complete, the Council will continue to focus on its current strategic objectives of:

- developing uniform regulatory initiatives through the National Directory for Radiation Protection (NDRP)
- reviewing and providing advice to the Minister on amendments to the Act and a remake of the Regulation
- identifying and addressing emerging issues in radiation protection, such as new technology

- identifying procedures and requirements to prevent or minimise dangers arising from the misuse of radiation sources, specifically influencing better reporting of radiation accidents through education, emphasising responsiveness and prevention.

The Council's work

National uniformity

In August 1999, the then Australian Health Ministers' Conference (AHMC), now the Health Chief Executives Forum (HCEF), agreed to develop the National Directory for Radiation Protection (NDRP) to promote national uniformity in radiation protection. Australian jurisdictions agreed to adopt codes and standards in the NDRP in their radiation protection frameworks.

Radiation Health Committee

The Radiation Health Committee (RHC) is responsible for the development of codes and standards for radiation protection in Australia for inclusion in the NDRP. The EPA represents NSW on the RHC.

The Council advises the EPA on the development of codes and standards which together form ARPANSA's Radiation Protection series (RPS) and other RHC policy documents.

In October 2021 the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) published a new edition of the NDRP, incorporating several new and updated codes and standards the Council had previously advised on. This included a new edition of the code of practice covering medical radiation exposure.

During 2021–22 the Council considered these national uniformity matters:

- RPS publications: ARPANSA advised it will consult widely on the future framework of the Radiation Protection Series (RPS), mix of specific codes of practice and more guidance documents. The Council at its December 2021 meeting suggested the EPA consider raising the above matter with enHealth. Subsequently, it has been agreed to continue the work on the current RPS series to ensure that codes are up to date while discussions about the overall RPS framework continue.
- Personal Monitoring Devices (PMDs) in hand luggage screeners: after several instances of false high dose reports attributed to higher energy CT baggage scanners, the RHC adopted a NSW-proposed RHC Statement on Wearable Personal Dosimetry and X-ray Security Scanners. ARPANSA will progress adopting a policy to allow travelling radiation workers to keep PMDs out of hand baggage X-ray screeners with the Department of Home Affairs.
- RHC Compliance Testing Standard for Diagnostic Imaging Apparatus: an RHC working group developed a draft national diagnostic imaging testing standard to evolve to nationally agreed standards, which the working group considers will benefit operators and testers. The draft standard is similar to NSW's Radiation Guideline 6: Compliance Requirements for Ionising Radiation Apparatus used in Diagnostic Imaging (2020) but does not cover bone mineral densitometry (BMD), veterinary and dental apparatus.
The EPA advised Council that the updated EPA Radiation Standard 6 will remain in force.
- ARPANSA Australian Radiation Register Annual Report January–December 2020.

enHealth and Radiation Health Expert Reference Panel (RHERP)

In 2019 the Standing Committee on Environmental Health (enHealth) – a committee of the Australian Health Protection Principal Committee (AHPPC) – established the Radiation Health Expert Reference Panel (RHERP) to advise enHealth on radiation health-related matters.

While the RHC's work plan focuses on the development of codes, guides and standards, the focus of RHERP's work is to implement policy and develop regulatory approaches with a view to achieving national consistency in the areas of radiation safety and protection, and to provide oversight of implementation of the findings from the IAEA Integrated Regulatory Review Service (IRRS) 2017 Mission to Australia.

A return IAEA mission, which will measure progress towards addressing its recommendations, is scheduled to occur in the second half of 2023.

The Council provides advice to the EPA who represents NSW on RHERP.

Review of the *Radiation Control Act 1990*

During the previous reporting period the EPA commenced a statutory review of the Act. Section 39B of the Act requires the Minister to review the Act after 10 years from the commencement of substantial amendments to the Act made in 2010. The Minister must seek, and take into consideration, the advice of the Council when undertaking the review.

The Minister, in the previous period, approved the establishment of a working group to assist in the review. The Council nominated several members to the Council's working group.

During the reporting period the Council:

- continued assisting in the development of an Issues Paper for the review
- was provided with the Issues Paper (the EPA released the paper for public comment between 23 August 2021 to 27 September 2022)
- considered a submissions summary following the public consultation of the paper
- noted that a report on the review of the Act was provided to the Minister in December 2021
- received regular updates on the progress of the review.

The Minister tabled a report on the review in Parliament in December 2021. The Government is considering the recommendations of the report.

Radiation Control Regulation 2013

Automatic repeal of the Radiation Control Regulation 2013 is scheduled to occur on 1 September 2023, unless it is remade, under the provisions of the *Subordinate Legislation Act 1989*.

During the reporting period, the Council agreed that the membership for the working group established to review the Act reconvene as the Radiation Regulation Review Committee to advise on the review of the Regulation. This committee met for the first time in June 2022.

Council advice to the EPA on radiation matters

During the reporting period, the Council continued to provide advice to the EPA in relation to routine radiation matters, including:

- licensing matters and non-standard licence applications (see **Licensing and accreditation**)
- assessment of radiation safety courses, for radiation user licensing purposes (see **Committees of the Council – Course and Competency Committee**)
- accreditation matters and non-standard accreditation applications (see **Licensing and accreditation**)
- review of radiation accidents and incidents (see **Radiation accidents**).

Committees of the Council

Under section 31 of the Act, the Council can establish committees to help it perform its functions. In 2021–22, the following Council committees were active:

Course and Competency Committee

During the reporting period the committee continued to review course applications as part of its ongoing work and on the recommendation of the committee the EPA:

- approved two courses for radiation user licencing purposes to be delivered online, as a result of COVID-19 restrictions, as an interim measure until January 2022
- approved one course for radiation user licensing purposes
- implemented the committee’s recommendation that all course providers, who had sought interim approval to delivery their courses online, resume face-to-face delivery of courses after the end of the lockdowns arising from COVID-19. The approval was on the basis that any course provider wanting to deliver their course online (originally approved by the EPA for face-to-face delivery) would need to submit a new application for online delivery of their course/s.

Strategic Direction Committee

The Council in June 2020 established the Strategic Direction Committee to review the Council’s strategic direction. During this reporting period the Council endorsed the terms of reference and membership of the committee. The Committee will carry out this work:

- review the Council’s Strategic Direction 2016–19 approach, objectives, priorities and achievements
- develop the Council’s strategic approach and document a Council Strategic Direction with objectives and priorities for the period 2022 to 2025
- ascertain whether outstanding projects need to be carried forward and/or new projects should be considered.

The EPA informed the Council that the committee’s work had not progressed due to the impending amendments to the Act.

Radiation Legislation Review Committee’s

The Council in the previous period established two committees Radiation Control Act Review Committee and the Radiation Regulation Review Committee (see The Council’s Work: Review of Radiation Control Act 1990 and Radiation Control Regulation 2013).

Licensing and accreditation

Under Part 2 of the Act, the EPA is the authority responsible for administering:

- radiation user licences
- radiation management licences
- accreditation of consulting radiation experts
- accreditation of radiation security assessors.

Under section 30 of the Act, the Council may give generic or specific advice to the EPA on applications. The EPA considers the Council’s standing advice for all applications submitted to it.

The Council and the EPA work together on determining the outcomes of applications, as set out in the MoU between the Council and the EPA (see Appendix D).

During 2021–22, the Council:

- provided specific advice on licensing and accreditation matters (see Council's advice to the EPA)
- reviewed licensing and accreditation statistics reports provided by the EPA at each meeting.

Radiation user licences

Number of radiation user licences issued by the EPA

During the reporting period ending 30 June 2022, the Council was advised that the EPA:

- issued 2,688 radiation user licences
- renewed 7,709 radiation user licences.

At the end of the reporting period, the EPA administered a total of 18,611 active radiation user licences (6,351 one-year licences and 12,260 three-year licences).

Council's advice to the EPA

During 2021–22, the Council provided the EPA with advice, provided below, regarding radiation safety and licensing requirements for a wide range of occupational areas that use radiation.

Non-standard user licence applications

The Council reviewed and advised on 14 non-standard user licence applications.

Radiation user licence criteria and conditions

During the reporting period the Council:

- endorsed amendment to user licence conditions IA50 and S50 (use radiation apparatus and radioactive substances for the purposes of audit, calibration, storage and emergency response) to allow non-authorized officers to perform certain functions under these licence conditions
- considered the amendments to user licences IA17 and IA17S (user radiation apparatus for nuclear medicine physicist purposes) to include use of apparatus for radiology physicist purposes (the matter arose as no specific licence condition existed for radiology medical physicists)
- considered the proposal to amend radiation user licence IA14R (use radiation apparatus for medical diagnostic radiography – restricted (for General medical practitioners or registered nurse – remote operators) to resolve difficulties associated with documentation required when a qualified radiographer is unable to perform X-ray examinations in a remote location. The Council recommended that the licence conditions be reworded to focus on the remote operator as the person responsible for checking on the radiographer's availability. The Council requested that the EPA seek comment from the NSW Health General Manager, Imaging Services (seeking the change) and EPA Legal. At the time of writing this report the EPA was in the process of undertaking this action.
- considered the proposal to amend the criteria for the IA20 radiation user licence (use radiation apparatus for general dental radiography (for Dental assistants/nurses) to remove specific reference to the NSW qualification and referencing the national training package (certificate IV in dental). The Council recommended that the EPA seek advice from Australian Skills Quality Authority (ASQA) about the course components related to radiation protection and the qualifications criteria of trainers who deliver the courses prior to the matter being referred to the Council's Course and Competency Committee for review. At the time of writing this report the EPA was considering this matter.

Other radiation licensing matters

During the reporting period the Council:

- requested that the EPA liaise with NSW Health regarding the future delivery of the course *NSW Limited Licence X-ray Operators course* for radiation user licence IA14 R (use radiation apparatus for diagnostic radiography – restricted (for remote operators) as the course ceases to be delivered after December 2021. The NSW Health representative on the Council agreed to raise the matter with relevant parties. At the time of writing this report NSW Health were liaising with the Health Education and Training Institute (HETI) regarding transfer of the course.
- recommended that ex-employees of ANSTO be granted equivalent EPA radiation user licence S36 (to use radioactive substances for radiopharmacy) subject to a letter from ANSTO detailing the person's training and experience.

Radiation management licences

Number of radiation management licences issued by the EPA

During the reporting period ending 30 June 2022, the Council was advised that in 2021–22 the EPA issued:

- 242 general management licences
- 5 sell-only management licences.

At the end of the reporting period, the EPA administered 2,845 active management licences (2,736 general and 109 sell-only).

Council's advice to the EPA

During 2021–22, the Council:

- considered a paper from the EPA on the International Commission of Radiological Protection (ICRP) Radon Dose Conversion Factors and the need to strengthen regulatory oversight of NSW cave workers. The Council endorsed the recommendations that the EPA:
 1. adopt the new ICRP factors for NSW
 2. require employers to develop and adopt an approved radiation management plan through the provisions of clause 28 of the Regulation.
 3. require employers of cave workers to provide cave workers with personal radiation monitoring devices PMD (if PMD provider available) or to install appropriate radiation area monitoring within the caves system under the provisions of clause 31 of the Regulation.

The EPA also agreed to investigate whether a PMD provider can provide the PM for this purpose and, if so, that the EPA seek to have the device approved in NSW.

At the time of writing this report, the EPA was investigating whether an appropriate PMD was available for such purposes.

- provided the EPA with comments on the radiation management plan for the recommissioning of the Cyclotek cyclotron located at Macquarie University Hospital
- considered EPA advice to the Dental Corporation Pty Ltd regarding compliance testing of dental X-ray units where contracted CREs were unable to test apparatus due to COVID-19 restrictions
- considered the RPA radiation safety report on the operation of the RPA PETtrace cyclotron and ancillary facilities from 1 January to 31 December 2021
- considered the Liverpool Hospital report on the operation of cyclotron and ancillary facilities for the period of May 2020 to May 2021
- reviewed and provided advice to the EPA regarding the draft HIBBS Jenolan Caves Radon Monitoring Program review

- reviewed proposed changes to the management licence conditions 3.1.5 regarding the introduction of mandatory Quality Assurance programs for radiology and computed tomography imaging apparatus which allows owners the ability to put apparatus back into use and arrange for compliance testing in a reasonable time frame. It is noted the Council in the previous period considered the Royal Prince Alfred Hospital (RPA) radiation safety report on the operation of the RPA PET trace cyclotron and ancillary facilities from 1 January 2020 to 31 December 2020 (an omission from the Council's previous annual report).

Consulting radiation experts

Accreditation and activities of consulting radiation experts

The EPA accredits CREs to assess apparatus and/or premises and issue a certificate of compliance verifying that regulated material complies with the requirements of licensing.

Council's advice to the EPA

Section 9A of the Act provides that the EPA may seek the Council's advice on accreditation matters.

During the reporting period ending 30 June 2022, the Council:

- reviewed the proposed RHC Compliance Testing Standard – Council members discussed the proposed national standard and noted issues with the draft and that adoption of the standard in NSW would not be appropriate. The EPA advised that the updated EPA Standard 6 Compliance Requirements for Ionising Radiation apparatus used in Diagnostic Imaging (2020) will remain in force.
- endorsed the amendments to CRE conditions of accreditation to require CREs to enter details of apparatus compliance tested in the EPA eConnect CRE portal
- reviewed EPA advice to all CREs advising of the provisions in place regarding compliance testing during NSW Covid-19 lockdowns. The EPA advised CREs it will use its discretion when considering enforcement action in relation to the requirement for diagnostic imaging apparatus having a current compliance certificate. In addition the advice to CREs was that once lockdowns have finished that compliance testing is to be completed as soon as possible.

Number of CREs accredited by the EPA

At 30 June 2022, the EPA held a total of 111 active accreditations.

Radiation security assessors

Accreditation and activities of radiation security assessors

Radiation security assessors are accredited to review source security and source transport plans to ensure they are made or amended in accordance with the requirements of section 14 of the Act, and to endorse those plans that satisfy those requirements.

A person responsible for a category 1, 2 or 3 security-enhanced source must prepare and follow an endorsed source security or transport security plan as required under the provisions of Part 2A of the Act.

Number of radiation security assessors accredited by the EPA

At 30 June 2022, three radiation security assessors held active accreditation from the EPA.

Summary of licences and accreditations issued by the EPA

Table 1 summarises the radiation licences and accreditations issued by the EPA active at 30 June 2022.

Table 1: Active licences and accreditations at 30 June 2022.

| Category | Number |
|--|---------------|
| Licence to use regulated material | 18,611 |
| Management licences (general) | 2,736 |
| Management licences (sell only) | 109 |
| Accredited consulting radiation experts | 111 |
| Accredited radiation security assessors | 3 |
| Total radiation licences and accreditations | 21,570 |

Radiation accidents

Mandatory requirement to report radiation accidents

Clause 37 of the Regulation outlines the types of incidents classified as radiation accidents. Clauses 38 and 39 of the Regulation details the mandatory requirements imposed on persons responsible for regulated material for the reporting and recording of radiation accidents.

Causes of radiation accidents

The root cause of radiation accidents are typically complex and accidents can be prevented by addressing one or more causal factors. Factors include deficiencies in management systems, a failure to implement controls and procedures correctly, communication errors and equipment failure.

A priority for the Council is the continual improvement of practices to reduce preventable accidents. The Council, through its membership affiliations, encourages safety leadership, thorough investigation of the cause of accidents as a means of improving risk controls and sharing lessons learned.

Serious accidents reported to the Health Care Complaints Commission

In addition to conducting its own investigations into possible breaches of the radiation legislation, the EPA's standing advice from the Council is that any reported accident which may cause a patient to have a serious health-related affect be reported to the Health Care Complaints Commission (HCCC) for further investigation.

During 2021–22 the EPA referred one accident to the HCCC. The accident involved a cancer patient who was prescribed pallative radiation therapy and who received incorrect treatment for four out of five prescribed fractions. This resulted in the patient's normal tissues receiving 16 Gray instead of the tumour target. At the time of writing this report the EPA was waiting on a response from the HCCC.

Australian Radiation Incident Register

All accidents reported to the EPA, are reported to ARPANSA by the EPA for inclusion in the Australian Radiation Incident Register (ARIR). The accident register is intended to raise awareness on where, how and why incidents and events occur, how they can be prevented and to facilitate the sharing of lessons learned from radiation incidents across Australia.

Number of accidents reported to the EPA

During the reporting period ending 30 June 2022, the EPA received – and the Council reviewed – 263 accident reports:

- 172 instances where accidents reported doses of over 1 millisievert (mSv) involving 188 people, summarised in Table 2
- 91 instances where accidents reported doses of less than 1mSv involving 93 people, summarised in Table 4.

Council's advice to the EPA

During this reporting period, the Council reviewed each accident report and, where appropriate, made recommendations that in its opinion would reduce the risk of a recurrence, including:

- recommended the EPA write to equipment providers to ascertain status of malfunction repairs as a result of an increased trend of equipment malfunctions
- recommended the EPA write to the NSW Clinical Health Commission and relevant facilities emphasising the appropriate ordering of procedures under the EPA management licence conditions. The Council provided input to correspondence sent to relevant management licence holders regarding appropriate ordering of medical imaging procedures.
- considered a HCCC complaint to the EPA regarding work practices in a hospital radiology oncology department. The Council advised the EPA the matter was not a radiation safety issue and recommended that no further action was required by the EPA.
- requested the EPA, due to the trend in linear accelerator equipment failures, provide it with a further breakdown of equipment failures to establish if the same brand of equipment has the same errors across different sites
- requested the EPA, due to an increase in preventable accidents, liaise with NSW Health and present accident statistics with the relevant Health Ministry groups. The EPA provided a presentation to the relevant NSW Health forum regarding the EPA's findings raising awareness on preventable accidents.
- requested the EPA provide guidance to persons reporting accidents on how to report dose estimates correctly and reporting time frame requirements. The EPA is providing guidance to reporters on an ongoing basis.

Summary of radiation accidents considered by the Council in 2021–22

In 2021–22, 263 accidents were presented to the Council for comment. This total represents a 26% increase on the total accidents reported in the previous year (209) and reaffirms the strong year-on-year upward trend in reporting.

Reports of both minor (< 1mSv) and significant (> 1mSv) accidents have increased, with increased numbers for each (91 and 172 reports respectively).

Summary of reported accidents:

1. Accidents reported in Nuclear Medicine and Radiology are typical of previous years with a marked increase in reported accidents from Radiation Oncology.
2. Human error is the primary cause of reported accidents with the majority due to failure to follow procedures and protocols or incorrect interpretation of patient information.
3. Equipment failures reported increased substantially and now account for 30% of all accidents (20% in 2021).

With human error as a leading cause of most accidents, preventative strategies remain focused on improving the situational awareness of radiation workers, for example by including systems to double-check procedure details prior to any planned exposure.

Campaign and educational activities carried out by the EPA have led to the increased reporting of machine/software-based accidents in Radiation Oncology in FY2022.

Table 2 and 4 provide summaries of the causes of accidents that were reported to the EPA and reviewed by the Council in 2021–22.

Table 2: Summary of causes of radiation accidents (> 1mSv) reported in 2021–22, by accident category and type.

| Type of accident | Nuclear medicine | Radiology | Therapy | Other | Total |
|--|------------------|-----------|-----------|----------|------------|
| Patient notes/plans/requests not interpreted/read/checked correctly | 4 | 19 | 3 | 0 | 26 |
| Incorrect isotope selected and drawn up | 1 | 1 | 0 | 0 | 2 |
| Incorrect isotope drawn up by supplier | 0 | 0 | 0 | 0 | 0 |
| Equipment/software failure | 19 | 12 | 24 | 0 | 55 |
| Booking/request error: Incorrect procedure requested for the right patient | 1 | 3 | 0 | 0 | 4 |
| Booking/request error: Failure to cancel booking | 0 | 0 | 0 | 0 | 0 |
| Booking/request error: Booking request not amended with new scan requested | 0 | 0 | 0 | 0 | 0 |
| Booking/request error: Same examination repeated | 0 | 2 | 0 | 0 | 2 |
| Booking/request error: Wrong patient name entered on request form | 0 | 1 | 0 | 0 | 1 |
| Radiopharmaceutical not administered correctly (injection into cannula) | 1 | 0 | 0 | 0 | 1 |
| Operator/medical radiation practitioner error | 6 | 4 | 8 | 0 | 18 |
| Physiology (failure of radiopharmaceutical) | 0 | 0 | 0 | 0 | 0 |
| Calculation error | 1 | 0 | 1 | 0 | 2 |
| Protocols not followed | 3 | 8 | 14 | 0 | 25 |
| Patient ID not checked | 1 | 3 | 2 | 0 | 6 |
| Industrial/other | 0 | 0 | 0 | 0 | 0 |
| Human error (other) | 3 | 5 | 4 | 0 | 12 |
| Unforeseeable patient factor | 11 | 6 | 1 | 0 | 18 |
| Total number of reported accidents | 51 | 64 | 57 | 0 | 172 |

Table 3 gives the number of accidents, greater than 1mSv, reported to the Council between reporting period 2017–22.

Table 3: Accidents (>1mSv) reported to the Council between July 2017 and June 2022, by category.

| Accident category | 2017–18 | 2018–19 | 2019–20 | 2020–21 | 2022–22 |
|-------------------|------------|-----------|-----------|------------|------------|
| Nuclear medicine | 48 | 47 | 49 | 54 | 51 |
| Radiology | 54 | 35 | 27 | 56 | 64 |
| Therapy | 3 | 7 | 9 | 22 | 57 |
| Other | 0 | 0 | 0 | 0 | 0 |
| Total | 105 | 89 | 85 | 132 | 172 |

Before 2018 the Council was only provided with summaries of accidents involving more than 1mSv of radiation.

Table 4 summarises the causes of incidents, less than 1mSv, that were reported to the EPA and reviewed by the Council during 2021–22.

Table 4: Summary of causes of radiation incidents (<1mSv) reported in 2021–22.

| Type of accident | Nuclear medicine | Radiology | Therapy | Other | Total |
|--|------------------|-----------|-----------|----------|-----------|
| Patient notes/plans/requests not interpreted/read/checked correctly | 0 | 21 | 2 | 0 | 23 |
| Incorrect isotope selected and drawn up | 0 | 0 | 0 | 0 | 0 |
| Incorrect isotope drawn up by supplier | 0 | 0 | 0 | 0 | 0 |
| Equipment/software failure | 1 | 10 | 14 | 0 | 25 |
| Booking/request error: Incorrect procedure requested for the right patient | 0 | 2 | 0 | 0 | 2 |
| Booking/request error: Failure to cancel booking | 0 | 1 | 0 | 0 | 1 |
| Booking/request error: Booking request not amended with new scan requested | 0 | 0 | 0 | 0 | 0 |
| Booking/request error: Same examination repeated | 0 | 1 | 0 | 0 | 1 |
| Booking/request error: Wrong patient name entered on request form | 0 | 1 | 0 | 0 | 1 |
| Radiopharmaceutical not administered correctly (injection into cannula) | 0 | 0 | 0 | 0 | 0 |
| Operator/medical radiation practitioner error | 0 | 3 | 1 | 0 | 4 |
| Physiology (failure of radiopharmaceutical) | 0 | 0 | 0 | 0 | 0 |
| Calculation error | 0 | 0 | 0 | 0 | 0 |
| Protocols not followed | 1 | 17 | 0 | 0 | 18 |
| Patient ID not checked | 0 | 7 | 0 | 0 | 7 |
| Industrial/other | 0 | 0 | 0 | 0 | 0 |
| Human error | 0 | 6 | 0 | 0 | 6 |
| Unforeseeable patient factor | 0 | 3 | 0 | 0 | 3 |
| Total number of reported accidents | 2 | 72 | 17 | 0 | 91 |

Table 5 summarises reported incidents <1mSv between reporting period 2018–22.

Table 5: Summary of reported incidents <1mSv between 2018–22.

| Accident group category | 2018–19 | 2019–20 | 2020–21 | 2021–22 |
|-------------------------|-----------|-----------|-----------|-----------|
| Nuclear medicine | 11 | 8 | 12 | 2 |
| Radiology | 57 | 21 | 64 | 72 |
| Therapy | 0 | 16 | 1 | 17 |
| Other | 1 | 1 | 0 | 0 |
| Total | 69 | 46 | 77 | 91 |

Appendix A: Council's Membership in 2021–22

| Member | Appointed position |
|--|---|
| Ms Karen Marler (appointed 16/4/2021, term expires 15/4/2024) | Chairperson |
| Dr Philip Pasfield (re-appointed 8/6/2022, term expires 22/1/2025) | Medical practitioner who is a specialist in radiology |
| Mr Luke Platt (appointed 8/6/2022, term expires 22/1/2025) | Radiographer with expertise in the field of human diagnostic radiography |
| Mr Frank Galea (re-appointed 1/12/2020, term expires 30/11/2023) | Person with expertise in the industrial uses of radiation |
| Mr Brent Rogers (re-appointed 19/12/2019, term expires 18/12/2022) | Person with expertise in health physics |
| Dr Hugh Dixon (re-appointed 8/6/2022, term expires 22/1/2025) | Medical practitioner who specialises in nuclear medicine |
| Assoc. Prof. Lee Collins AM (re-appointed 1/12/2020, term expires 30/11/2023) | Person with expertise in non-ionising radiation |
| Andrew Niven (appointed 19/12/2019, term expires 18/12/2022) | Person with expertise in work health and safety |
| Ms Penny Murray (appointed 1/2/2021, term expires 30/11/2023) | Person who is an Australian lawyer of at least seven years' standing |
| Ms Joanne Muller (re-appointed 16/4/2021, term expires 15/4/2024) | Person who represents community interests |
| Ms Ingrid Klobasa (appointed 16/4/2021 – resigned 3/6/2022) Vacant (appointment yet to be confirmed) | Person nominated by the Secretary of the Ministry of Health |
| Dr Dion Forstner (re-appointed 8/6/2022, term expires 22/1/2025) | Radiation oncologist |
| Mr Thomas Greig (appointed 8/6/2022 – term expires 22 January 2025) | Medical physicist |
| Mr Mark Moskvitch (appointed 18/10/2019, term expires 17/10/2022) | Person nominated by the Secretary of the Department of Finance, Services and Innovation (now Customer Service) involved in the administration of the <i>Work Health and Safety Act 2011</i> |

| | |
|---|--|
| Mr Cameron Jeffries (re-appointed 1/12/2020, term expires 30/11/2023) | Person with expertise in naturally occurring radioactivity |
| Mr John Stacpoole (appointed 18/10/2019, term expires 17/10/2022) | Person with expertise in mine radiation safety |
| Ms Taleen Shamlan (appointed 16/4/2021, term expires 15/4/2024) | Person chosen by the Minister |

Acronyms and abbreviations

| Acronym or abbreviation | Name |
|-------------------------|---|
| ACPSEM | Australian College of Physical Scientists and Engineers in Medicine |
| AHPPC | Australian Health Protection Principal Committee |
| ARPANSA | Australian Radiation Protection and Nuclear Safety Agency |
| CRE | Consulting Radiation Expert |
| enHealth | Environmental Health Standing Committee |
| EPA | NSW Environment Protection Authority |
| HCCC | NSW Health Care Complaints Commission |
| IAEA | International Atomic Energy Agency |
| MoU | Memorandum of Understanding |
| mSv | millisievert |
| NDRP | National Directory for Radiation Protection |
| PMD | Personal Monitoring Device |
| RAC | Radiation Advisory Council |
| RHC | Radiation Health Committee |