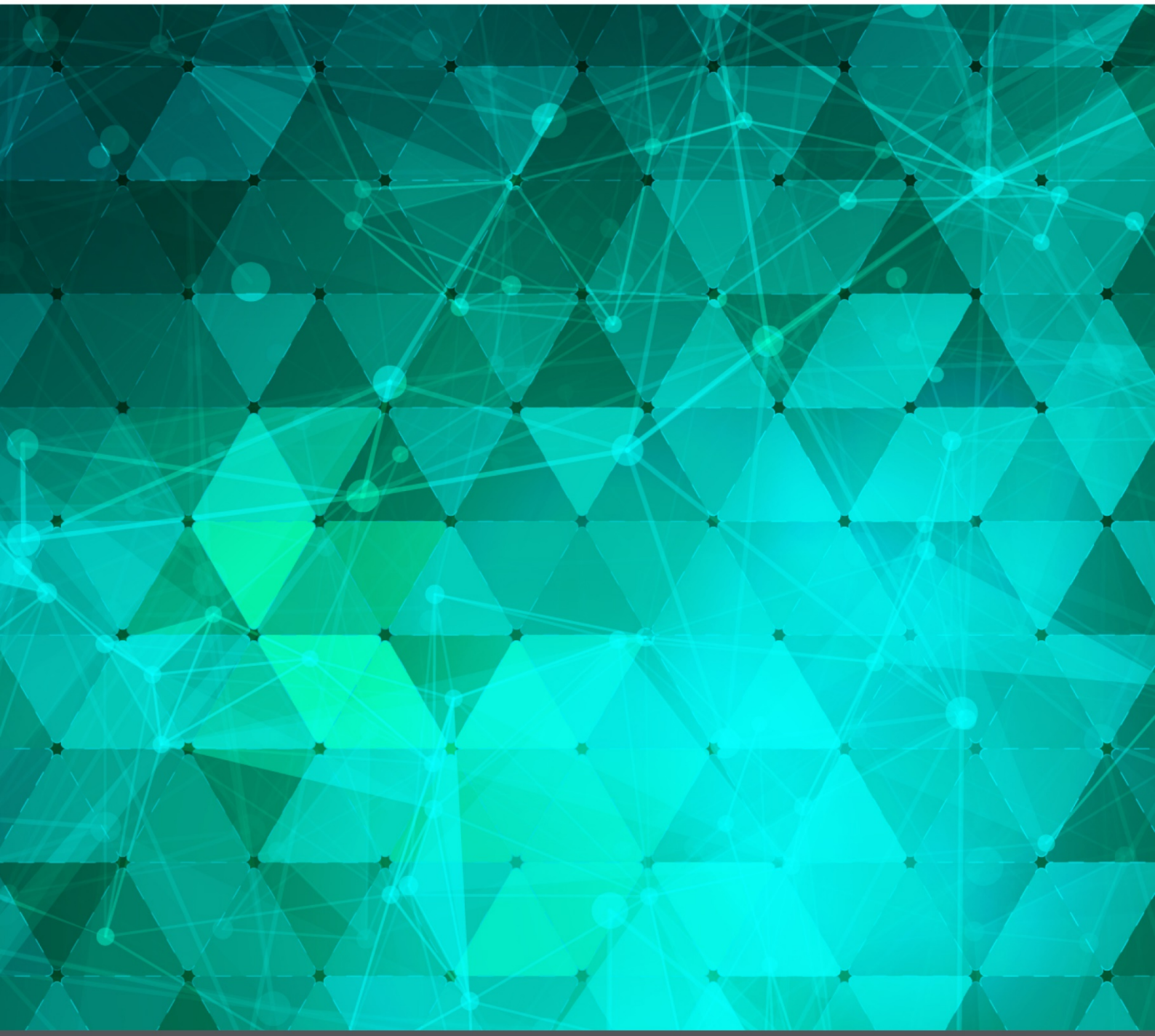
Australian Government

National Directory for Radiation Protection – 2nd Edition



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This document has been developed by the Commonwealth, states and territories of Australia, and the Australian Health Protection Principal Committee is responsible for updating it from time to time.

Acknowledgement of Country

ARPANSA proudly acknowledges Australia's Aboriginal and Torres Strait Islander communities and their rich culture and pays respect to their Elders past and present. We acknowledge Aboriginal and Torres Strait Islander peoples as Australia's first peoples and as the Traditional Owners and custodians of the land and water on which we rely.

We recognise and value the ongoing contribution of Aboriginal and Torres Strait Islander peoples and communities to Australian life and how this enriches us. We embrace the spirit of reconciliation, working towards the equality of outcomes and ensuring an equal voice.

Contents

Introduction

Citation

1 This publication may be cited as the *National Directory for Radiation Protection (2nd Edition, 2021)* (NDRP 2nd edition, 2021). It supersedes the 1st Edition of the NDRP and subsequent revisions, published as Radiation Protection Series (RPS) No. 6.

Background

2 In August 1999, the Australian Health Ministers' Conference (now the Council of Australian Governments (COAG) Health Council (CHC)) endorsed the development of the National Directory for Radiation Protection (the NDRP) as the means of achieving uniformity in **radiation** protection policies and practices among the Commonwealth, the States and Territories. Ministers agreed that upon approval of the provisions of the NDRP, the regulatory elements of the NDRP must be adopted as soon as possible in each jurisdiction's regulatory framework.

3 Ministers recognised that, as a variety of agencies in many jurisdictions (e.g. mines, occupational health and safety, and transport agencies) have legislated responsibility for aspects of radiation safety, these agencies ought to be involved in measures to progress national uniformity.

4 The first edition of the NDRP was published in 2004. Since then, it has been amended seven times to incorporate new and updated regulatory elements that were approved by the CHC.

Vision and purpose

5 The Commonwealth, the States and Territories agree to work towards achieving the vision of a seamless regulatory framework for the safe generation and use of radiation across the Commonwealth, States and Territories

6 The purpose of the NDRP is to facilitate work towards achievement of the vision, by:

a) providing a national framework for management of **radiation risks** to people and to the **environment**, and

b) promoting **mutual recognition** of **authorisations** issued under radiation safety **legislation**.

Scope

7 The NDRP covers management of radiation risks from **ionising radiation** in **planned exposure situations, emergency exposure situations** and **existing exposure situations**. It also covers the management of radiation risks from **non-ionising radiation**.

8 The NDRP applies to all sectors implementing controls related to radiation risks, including but not limited to mining, mineral processing, **nuclear installations**, research, and education.

Interpretation

9 Terms used in the NDRP are explained in the Glossary. Where a word or phrase is defined in the Glossary, it will appear in bold style font at the first mention in the body of the text.

10 The use of the phrase 'radiation protection' in the NDRP includes safety measures to manage radiation risks including radiation safety, nuclear safety, transport safety, waste safety, measures directed at preparedness for an emergency, and managing safety during and after an emergency. It also includes security measures including, for example, preventing unauthorised or malicious use of radiation. It applies to both ionising radiation and non-ionising radiation.

11 Unless specific mention is made of a particular measure, the use of the term 'safety' in the NDRP includes all aspects of radiation protection referred to above for the protection of people and the environment from radiation risks. It does not include work health and safety, product safety or other aspects of safety not specifically captured by radiation protection legislation.

Structure of the NDRP

12 Part A of the NDRP sets out the legislative framework for radiation protection in Australia, based on international best practice. All jurisdictions have agreed to implement this framework. Part B of the NDRP sets out the regulatory arrangements that jurisdictions have agreed to implement to support the agreed legislative framework in Part A.

13 The NDRP also includes schedules with **dose limits**, **reference levels**, **dose coefficients, exemption** levels and exempt sources and apparatus, and lists codes and other documents that jurisdictions have agreed to implement through legislation or **licence** conditions.

Governance

14 Amendments to the NDRP will be considered and approved by the Health Council.

15 In accordance with the functions set out in section 23 of the *Australian Radiation Protection and Nuclear Safety Act 1998*, the **Radiation Health Committee (RHC)** will formulate draft radiation protection codes and standards for consideration by the Commonwealth, the States and Territories. The RHC will also periodically review adopted codes and standards to ensure they continue to reflect world best practice.

16 The RHC will ensure that new or amended radiation protection codes and standards meet the requirements of the *COAG Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies (2007)* (COAG Guidelines) and any additional or special requirements of each State and Territory.

17 The CEO of ARPANSA will present radiation protection codes or standards formulated by the RHC to the Environmental Health Standing Committee (enHealth) for consideration and adoption by the Commonwealth, the States and Territories.

18 enHealth will oversee implementation of the NDRP and will facilitate cross-jurisdiction dissemination of national and international experience gained in the implementation of radiation safety legislation in order to continuously improve consistency and rigour of the national framework for radiation protection.

PART A – Legislative framework for radiation protection

Scope

20 Jurisdictions agree that their radiation protection legislation will be consistent with the applicable requirements in the International Atomic Energy Agency *General Safety Requirements No. GSR Part 1 (Rev.1*) *Governmental, Legal and Regulatory Framework for Safety (2016)* and be able to fully implement the agreed regulatory arrangements in Part B below.

21 As a minimum, jurisdictions' legislation will:

a) have, as an objective, the protection of the health and safety of people and the environment from the harmful effects of ionising and non-ionising radiation

b) incorporate the principles of **justification**, **optimisation** and **limitation** for ionising radiation (see Fundamentals for Protection against Ionising Radiation, Radiation Protection Series F-1) (see also Schedule 1)

c) incorporate arrangements for managing radiation risks from non-ionising radiation (see Schedule 1)

d) provide for the application of a **graded** (risk based) approach to the implementation of controls to address public, occupational, and medical exposure, and **protection of the environment** in situations of exposure to ionising or non-ionising radiation

e) prohibit any dealing with a **radiation source** without the appropriate authorisation, unless the source is **excluded**, exempt or constitutes an authorised source, material or object that can be **cleared** from further regulatory control

f) include requirements to ensure that authorised persons ensure that adequate provisions (including financial provisions) are made to cover the cost of managing a disused radioactive source

g) provide for a person with responsibility for managing radiation risks (a '**responsible person**'). The 'responsible person' is required to make **notifications** and gain approvals and other relevant authorisations from regulators before conducting a practice. These authorisations include **registrations**, licences or **accreditations**

h) require responsible persons to establish a radiation risk management system that ensures:

i) a culture of safety

ii) quality over the life-cycle of a practice, a source within a practice, or a facility

iii) reduction of the probability of human error that could lead to **accidents**

iv) prevention of accidents and mitigation of consequences of accidents on and off-site

v) making radiation safety training and information available to staff

vi) safety and security of radiation sources over their lifetime (including **disposal**)

vii) provision of necessary qualified expertise

viii) undertaking **safety assessments** to verify safety and security

ix) maintenance of appropriate records

x) consultation with interested parties and the public about radiation risks and regulatory measures:

i) provide for the control of planned exposure situations, existing exposure situations and emergency exposure situations involving ionising radiation

j) provide for a system of authorisations, registrations and notifications

k) provide requirements for engineered barriers and controls to restrict:

   i) radiation levels

   ii) release of **radioactive materials**, and

   iii) external and internal exposures, including exposures of relevance to environmental protection

l) provide for accrediting persons or classes of persons to assess compliance with the requirements of the legislation, including conditions of accreditation

m) provide for the establishment and maintenance of a register of radiation sources

n) require authorised parties to establish records of radiation doses incurred by staff and, where relevant, assess and maintain records of doses to the general public

o) include provisions to plan for, and provide advice in the case of, an emergency with radiological implications

p) include provisions requiring notification of **radiation incidents** to the radiation regulatory body (the Authority), investigation of radiation incidents, and notification to other jurisdictions, as appropriate.

Activities to which legislation applies

22 Legislation will apply to the following activities:

a) The manufacturing or possession of radiation sources.

b) The use of radiation or radioactive materials for any **radiation practice**, which involves or could involve exposure to radiation or radioactive materials. This includes medical (diagnostic and therapeutic), dental, chiropractic, industrial, veterinary and agricultural purposes. It also includes the use of radiation or radioactive materials in nuclear activities, consumer products, education, training, research, and the servicing or maintenance of **radiation apparatus** or **sealed source apparatus**.

c) Practices involving exposure to natural sources and exposures from past practices specified by the Authority as requiring control.

d) Practices dealing with radioactive material arising from exploration, mining, mineral processing or petroleum industries.

e) Practices involving radioactive waste management and the disposal of radioactive material.

f) Practices involving **non-ionising radiation apparatus**.

g) The sale or transfer of responsibility of radiation sources and apparatus.

h) The transport of radioactive material.

i) Any other radiation practice specified by the Authority.

Categories of authorisation

23 Legislation will establish different types of authorisations to regulate dealings with radiation sources. It will be a mandatory condition to hold a relevant authorisation for a particular dealing, unless exemptions, **exclusions** or **clearance** apply.

24 Authorisations will include:

a) authorisation to possess, which may be to possess a radiation source, or otherwise be in control of a radiation source (including transport), or be responsible for a practice

b) authorisation for a natural person to use a radiation source for a particular purpose

c) authorisations for other dealings associated with sites where radiation sources are located.

Granting an authorisation

25 Legislation will provide for the following criteria for the granting of authorisations:

a) the applicant is a fit and proper person

b) granting of the authorisation does not adversely affect public, environmental health, safety, or security, and

c) the proposed use of radiation is appropriate and justified.

PART B – Agreed regulatory arrangements

26 Jurisdictions agree to implement the regulatory arrangements in this Part and acknowledge that their legislation may require amendments from time to time to implement these agreed arrangements in a timely manner.

Mutual recognition

27 Jurisdictions agree to authorise a person to use radiation sources for a particular purpose, where that person has an equivalent authorisation in another jurisdiction without the need for that person to undergo further testing or examination. 'Equivalency' is based on an assessment of whether the activities allowed under the existing authorisation in one jurisdiction are substantially the same as those under the authorisation being applied for in another jurisdiction.

28 Jurisdictions agree to implement common competency requirements for radiation protection and safety to ensure consistency in the criteria for user licensing across Australian jurisdictions.

Competence and resources for safety

29 Jurisdictions agree to ensure that all parties with responsibility for safety of facilities and regulatory activities have the necessary competence and resources.

Emergency preparedness and response

30 Jurisdictions agree to develop and implement national coordination arrangements for emergency preparedness and response under the auspices of the Commonwealth's Health Emergency Preparedness and Response system.

Transport of radioactive material

31 Jurisdictions agree to develop and implement national coordination arrangements to ensure consistent review of applications for approval of package design and special form radioactive material design.

National radiation incident reporting framework

32 Jurisdictions agree that Authorities will report radiation incidents of the types described in Schedule 4 to ARPANSA for inclusion in the Australian Radiation Incident Register (ARIR).

33 Jurisdictions agree to develop and implement a system to assess the lessons learnt from the incidents reported to the ARIR and update relevant regulatory requirements or guidance.

Exclusions

34 Jurisdictions agree to exclude sources giving rise to exposures the magnitude or likelihood of which is not readily controllable through legislation, including:

a) Potassium 40 in the body

b) Cosmic radiation at the surface of the earth

c) Unmodified concentrations of radionuclides in most raw materials, unless otherwise specifically identified in the NDRP.

Exemption and clearance

35 Jurisdictions agree to exempt from notification, licensing and registration requirements those sources that meet Requirement 8, paragraphs 3.10 and 3.11 of the International Atomic Energy Agency General Safety Requirements No. GSR Part 3 *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards* and Schedule 2 of this document.

36 Jurisdictions agree to clear from regulatory control those sources, including materials and objects, within notified or authorised practices, in accordance with Requirement 8, paragraph 3.12 of IAEA GSR Part 3.

Prohibition

37 Jurisdictions agree to prohibit the use of **tanning units** in commercial settings.

Authorisations

38 Jurisdictions agree that a responsible person seeking to possess, use or otherwise deal with a radiation source for a specific purpose must hold an authorisation issued by the jurisdiction.

39 Jurisdictions agree that there will be a registration system to account for all non-exempt apparatus, sources and premises. The registration system will apply to the following categories:

a) sealed sources, sealed source apparatus, radiation apparatus, non-ionising radiation apparatus, and the premises or facilities on which these radiation sources and apparatus are secured, stored, used or manufactured, or disposed of

b) premises at which unsealed radioactive sources are stored or used, or

c) in the case of radiation sources that are intended for portable or field use, the sources and the principal place of storage.

Inspection and enforcement

40 Jurisdictions agree to develop and implement an adequately resourced inspection strategy and inspection program, in line with a nationally agreed compliance and enforcement strategy.

41 Jurisdictions agree to a national enforcement policy to direct staff in the application of enforcement actions, which are proportionate to the significance and nature of regulatory non-compliance.

Adoption and implementation of codes and standards

42 Jurisdictions agree to adopt and implement the publications listed in Schedule 3.

Services for rural and remote areas

43 Jurisdictions agree that an individual may be granted permission to undertake a restricted range of diagnostic X-ray services (without otherwise meeting the nationally agreed competency requirements for a radiographer) if:

a) the person has undertaken training accredited by the jurisdiction

b) appropriate conditions and restrictions regarding the services permitted to be provided are placed on the authorisation.

Schedule 1 – Dose limits, reference levels and dose coefficients

(*Refer to paragraph 21*)

The table below lists the publications that provide the applicable dose limits, reference levels, and dose coefficients.

	Dose limits, dose coefficients, reference levels	Publications
1.	Dose limits for occupationally exposed persons for ionising radiation	Schedule A to the *Code for Radiation Protection in Planned Exposure Situations*, Radiation Protection Series C-1 (Rev 1) (2020) (Planned Exposure Code)
2.	Dose limits for members of the public for ionising radiation	Schedule B to the *Code for Radiation Protection in Planned Exposure Situations*, Radiation Protection Series C-1 (Rev 1) (2020)
3.	Reference levels for existing exposure situations	See Annex A to *Guide for Radiation Protection in Existing Exposure Situations*, Radiation Protection Series G-2 (2017)
4.	Reference levels for emergency exposure situations	See section 2.6.1 of *Guide for Radiation Protection in Emergency Exposure Situations: Part 1 – The Framework*, Radiation Protection Series G-3 (2019)
5.	Dose coefficients	International Commission for Radiation Protection (ICRP) Publications 88, 95, 116, 119, 130, 134, 136, and 137 (see the most recent publications) United States Environmental Protection Agency (US EPA) Federal Guidance Report number 12

Radiation Protection Series (RPS) Codes and Guides: see https://www.arpansa.gov.au/regulation-and-licensing/regulatory-publications/radiation-protection-series

ICRP publications: see http://www.icrp.org/publications.asp

US EPA publication: see https://www.epa.gov/radiation/federal-guidance-report-no-12-external-exposure-radionuclides-air-water-and-soil

Schedule 2 – Exempt radiation apparatus and radioactive sources

(*Refer to paragraph 35*)

1. The radioactive sources listed below are exempt from authorisation or registration requirements. Note, however, that provisions requiring authorisation prior to disposal of these sources may apply, unless the disposal is in accordance with the *Code for the Disposal of Radioactive Waste by the User* (RPS C-6):

    a. americium-241 sealed sources of activity up to 40 kBq used in domestic smoke alarms meeting the requirements of AS3786:2014

    b. depleted uranium in solid massive form

    Note: depleted uranium is subject to permit requirements of the Australian Safeguards and Non-proliferation Office (ASNO)

    c. a gaseous tritium light source that is solely used for safety purposes and includes less than 74 GBq of tritium

    d. a sealed radioactive source used for teaching the characteristics and properties of radiation or radiation sources and containing a radionuclide listed in the table below, with an activity not greater than that listed in the table

Radionuclide	Activity (kBq)
Cobalt-60	200
Strontium-90	80
Caesium-137	200
Radium-226	20
Americium-241	40

e) a geological sample that contains radioactive material, if:

    i. it emits radiation at a level not more than 5 micrograys per hour, measured at a distance of 10 cm from its surface, and

    ii. it is being used as a sample in teaching or for display as a geological specimen.

f) an electron capture detector or similar device used in gas chromatography containing a nickel-63 sealed source with activity not more than 750 MBq, or tritium source with activity not more than 20 GBq

g) lighting products that include krypton-85.

Schedule 3 – Codes and standards

(*Refer to paragraph 42*)

The publications listed in Tables 1 and 2 are available at https://www.arpansa.gov.au/regulation-and-licensing/regulatory-publications.

Table 1: Radiation Protection Series (RPS) Codes developed by the Radiation Health Committee and approved for adoption by CHC

	Reference	Title
1.	RPS C-1	*Code for Radiation Protection in Planned Exposure Situations (2020)* (Rev 1)
2.	RPS C-2	*Code for the Safe Transport of Radioactive Material* (2019) (Rev 1)
3.	RPS C-3	*Code for Disposal Facilities for Solid Radioactive Waste* (2018)
4.	RPS C-4	*Code of Radiation Protection Requirements for Industrial Radiography* (2018)
5.	RPS C-5	*Code for Radiation Protection in Medical Exposure* (2019)
6.	RPS C-6	*Code for Disposal of Radioactive Waste by the User* (2018)
7.	RPS S-1	*Standard for Limiting Exposure to Radiofrequency Fields – 100 kHz to 300 GHz* (2021) (Rev. 1)
8.	RPS 5	*Code of Practice and Safety Guide for Portable Density/Moisture Gauges containing Radioactive Sources* (2004)
9.	RPS 8	*Code of Practice for the Exposure of Humans to Ionizing Radiation for Research Purposes* (2005)
10.	RPS 9	*Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing* (2005)
11.	RPS 10	*Code of Practice and Safety Guide for Radiation Protection in Dentistry* (2005)
12.	RPS 11	*Code of Practice for the Security of Radioactive Sources* (2019)
13.	RPS 12	*Radiation Protection Standard for Occupational Exposure to Ultraviolet Radiation* (2006)
14.	RPS 13	*Code of Practice and Safety Guide for Safe Use of Fixed Radiation Gauges* (2007)
15.	RPS 17	*Code of Practice and Safety Guide for Radiation Protection in Veterinary Medicine* (2009)
16.	RPS 19	*Code of Practice for Radiation Protection in the Application of Ionizing Radiation by Chiropractors* (2009)

Table 2: Radiation Health Series publications that were developed by the Radiation Health Committee prior to the ARPANS Act 1998*

	Reference	Title
1.	RHS 9	Code of Practice for Protection Against Ionizing Radiation Emitted from X-ray Analysis Equipment (1984)
2.	RHS 21	Statement on Cabinet X-ray Equipment for Examination of Letters, Packages, Baggage, Freight and Other Articles for Security, Quality Control and Other Purposes (1987)
3.	RHS 22	Statement on Enclosed X-ray Equipment for Special Applications (1987)
4.	RHS 24	Code of Practice for the Design of and Safe Operation of Non-medical Irradiation Facilities (1988)
5.	RHS 28	Code of Practice for the Safe Use of Sealed Radioactive Sources in Borehole Logging (1989)

*Note: Prior to the ARPANS Act 1998, the Radiation Health Committee developed publications, which were published by the National Health and Medical Research Council (NHMRC) as the Radiation Health Series (RHS). The Radiation Health Committee had representation from all jurisdictions, who agreed to the adoption of these publications. The publications listed in Table 2 are currently in use in some jurisdictions. The Radiation Health Committee constituted under the ARPANS Act 1998 is progressively reviewing the RHS publications and, where appropriate, is republishing the RHS publications under the Radiation Protection Series.

Table 3: IAEA publications

	Reference	Title
1.	IAEA/CODEOC/2004	Code of Conduct on the Safety and Security of Radioactive Sources (2004) and the supplementary guidance that support the code, namely, Guidance on the Import and Export of Radioactive Sources and Guidance on the Management of Disused Radioactive Sources.

Schedule 4 – National radiation incident reporting framework

(*Refer to paragraph 32*)

This schedule specifies the types of incidents that must be reported to ARPANSA for compilation in the Australian Radiation Incident Register (ARIR).

A **radiation incident** is any unintended or ill-advised event when using **ionising radiation apparatus**, specified types of non-ionising radiation apparatus or radioactive substances, which results in, or has the potential to result in, an exposure to radiation to any person or the environment, outside the range of that normally expected for a particular practice, including events resulting from operator error, equipment failure, or the failure of management systems that warranted investigation.

Paragraph 21 above provides that legislation in each jurisdiction must require notification of radiation incidents to the Authority. The Authority must provide information on radiation incidents of the following types to ARPANSA for inclusion in the ARIR. In some cases judgements will need to be made by the Authority in regard to whether an incident is too minor for reporting to the register.

1. Medical exposure of patients

(a) any diagnostic procedure other than as prescribed by the medical practitioner

(b) any diagnostic procedure resulting in an observable acute radiation effect

(c) any therapeutic treatment delivered to either the wrong patient or the wrong tissue, or using the wrong radiopharmaceutical

(d) when during the administration of a radioactive substance for diagnostic purposes, the activity of the substance administered exceeds the activity prescribed in the hospital/radiation practice standard protocol for that test by 50% or more

(e) when during the administration of a radioactive substance for therapeutic purposes, the activity administered differs from that prescribed by 15% or more

(f) when during administration of a therapeutic dose of radiation from a radiation apparatus or a sealed radioactive source, the dose delivered differs from the total prescribed treatment dose by more than 10%.

2. Incidents that cause or may lead to radiation injuries or radiation doses exceeding the annual dose limits to workers or members of the public

Note that situations where radiation injuries or high doses (exceeding 0.25 Sv whole body, 0.75 Gy organ dose, 6 Gy skin dose) occur must be reported to the ARIR as soon as possible, and within 24 hours. ARPANSA will report incidents exceeding these doses to the IAEA for inclusion on their severe incidents database.

3. Lost or stolen radioactive sources or radiation apparatus

4. Transport of radioactive material

(a) where a package is damaged during freight handling or transport

(b) where a package is transported without the required documentation, placarding or labelling.

5. Unintentional or unauthorised discharges of radioactive materials into the environment

Where unintentional or unauthorised activity discharges exceeding 100 times the exempt activity for the radionuclide specified in Schedule 2 have occurred. (Note: This provision does not apply to mining.)

6. Damage to, or malfunctioning of, a radiation apparatus or sealed source apparatus

Where the damage or malfunction could in any way affect the radiation safety of the apparatus, including issues such as shielding integrity or increased radiation levels.

7. Contamination with, or dispersal of, a radioactive material

Where a surface, substance or material is contaminated by a radioactive substance resulting from the spillage of more than 100 times the exempt activity of that substance specified in Schedule 2.

8. Out of control source of radiation

Where a radiation source is out of control, for example, where a source is not safely secured or shielded, or contamination is not confined.

9. Non-ionising radiation

Where there is actual injury, or the potential for injury, as a result of operator error, damage or malfunction of equipment, or failure of management systems, for the types of non-ionising radiation equipment specified below:

(i) lasers

(ii) radiofrequency generating equipment

(iii) man-made sources of ultraviolet radiation

(iv) magnetic resonance imaging machines

(v) Intense pulsed light equipment.

10. Nuclear Incidents

Where events such as criticality incidents or those relating to the safety of a nuclear installation occur.

11. Other incidents

Such incidents that the Authority must report include near-miss situations that may serve as a warning to other users, such as situations where radiation monitors at the entrance of scrap metal processing factories and landfill sites are triggered.

Glossary

Absorbed dose	The energy absorbed per unit mass by matter (e.g., tissue) from ionising radiation that impinges upon it. The SI unit for absorbed dose is joule per kilogram (J/kg), termed the *gray* (Gy). (See 'equivalent dose' below)
Accident	Any unintended event, including operating errors, equipment failures and other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection and safety.
Accreditation	An authorisation by the Authority given to a person for that person to provide specified radiation protection services.
Authorisation	A written permission granted by the Authority to a person to perform specified practices or activities. The form of an authorisation can include a licence, registration, or accreditation.
Clearance	Removal of regulatory control by the Authority from radioactive material or radioactive objects within notified or authorised facilities and activities. (From page 22 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).
Committed effective dose	The **effective dose** that a person is committed to receive following the intake of radioactive material. This dose can be calculated over any time period. Typically the time period is 50 years after intake for adults and to age 70 for children. (See 'Dose per unit intake' below)
Committed equivalent dose	The **equivalent dose** that a person is committed to receive following the intake of radioactive material. This dose can be calculated over any time period. Typically the time period is 50 years after intake for adults and to age 70 for children. (See 'Dose per unit intake' below)
Dose coefficient	Primarily describes the **dose per unit intake**, but is also used to describe other coefficients linking quantities or concentrations of activity to doses or dose rates, such as the external dose rate at a specified distance above a contaminated surface.
Dose limit	The value of the effective dose or the equivalent dose to individuals in planned exposure situations that is not to be exceeded.
Dose per unit intake	The **committed effective dose** or the **committed equivalent dose** resulting from intake, by a specified means (usually ingestion or inhalation), of unit activity of a specified radionuclide in a specified chemical form. (From page 46 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).
Disposal	Emplacement of waste in an appropriate facility without the intention of retrieval. (See also page 41 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).

Effective dose	A measure of dose that takes into account both the type of radiation involved and the radiological sensitivities of the organs and tissues irradiated. It is the quantity obtained by multiplying the equivalent dose to various tissues and organs by a weighting factor appropriate to each and summing the products. (The SI unit for *effective dose* is joule per kilogram (J/kg), termed the *sievert* (Sv)).
Emergency exposure situation	A situation of exposure that arises as a result of an accident, a malicious act, or any other unexpected event, and requires prompt action in order to avoid or reduce adverse consequences.
Equivalent dose	A measure of dose in organs and tissues that takes into account the type of radiation involved. It is the quantity obtained by multiplying the mean **absorbed dose** over the organ or tissue by a factor to allow for the different effectiveness of various ionising radiation in causing harm to tissue. (The SI unit for *equivalent dose* is joule per kilogram (J/kg), termed the sievert (Sv)).
Existing exposure situation	A situation of exposure that already exists when a decision on the need for control needs to be taken. Existing exposure situations include exposure to natural background radiation that is amenable to control; exposure due to residual radioactive material that derives from past practices that were never subject to regulatory control; and exposure due to residual radioactive material deriving from a nuclear or radiological emergency after an emergency has been declared to be ended.
Environment	The conditions under which people, animals and plants live or develop and which sustain all life and development; especially such conditions as affected by human activities. Protection of the environment includes the protection and conservation of: • non-human species, both animal and plant, and their biodiversity • environmental goods and services such as the production of food and feed • resources used in agriculture, forestry, fisheries and tourism • amenities used in spiritual, cultural and recreational activities • media such as soil, water and air • natural processes such as carbon, nitrogen and water cycles.
Exclusion	The deliberate excluding of a particular type of exposure from the scope of an instrument of regulatory control on the grounds that it is not considered amenable to control through the regulatory instrument in question. See also page 62 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).
Exemption	The determination by a regulatory body that a source or practice need not be subject to some or all aspects of regulatory control on the basis that the exposure and the potential exposure due to the source or practice are too small to warrant the application of those aspects or that exemption is the optimum option for protection irrespective of the actual level of the doses or risks.

Graded approach	An approach where the stringency of the control measures and conditions to be applied is commensurate, to the extent practicable, with the likelihood and possible consequences of, and the level of risk associated with, a loss of control (Note that the graded approach is applied to the controls and does not imply a relaxation of the level of protection) (Note that In Australia this concept is referred to as risk-based regulation or risk-based approach) See also page 75 of the IAEA Safety Glossary, 2016 Revision, June 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary
Ionising radiation	Electromagnetic or particulate radiation capable of producing ions directly or indirectly, but does not include electromagnetic radiation of a wavelength greater than 100 nanometres. Examples are alpha particles, gamma rays, X-rays and neutrons. When these radiations pass through the tissues of the body, they have sufficient energy to damage DNA.
Ionising radiation apparatus	An apparatus that produces ionising radiation when energised, or when assembled or repaired is capable of doing so when energised (e.g. a diagnostic X-ray machine or an industrial radiography X-ray machine).
Justification	For a planned exposure situation, the process of determining whether a practice is overall, beneficial, i.e. whether the expected benefits to individuals and to society from introducing or continuing the practice outweigh the harm (including radiation detriment) resulting from the practice. For an emergency exposure situation or an existing exposure situation, the process of determining whether a proposed protective action or remedial action is likely, overall, to be beneficial; i.e., whether the expected benefits to individuals and to society (including the reduction in radiation detriment) from introducing or continuing the protective action or remedial action outweigh the cost of such action and any harm or damage caused by the action. From page 89 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary)
Legislation	Acts of Parliament, regulations and other subordinate or disallowable instruments.
Licence	An authorisation granted by the Authority allowing a person to carry out a radiation practice.
Limitation	The requirement that radiation doses and risks must not exceed a value regarded as unacceptable. (See also principle 6 at page 21 of the *Fundamentals for Protection against Ionising Radiation*, Radiation Protection Series F-1)
Mutual recognition	Mutual recognition is the principle that a person who has been licensed or registered in one state or territory, can apply to be licensed or registered in another state or territory for an equivalent occupation. It is supported by the *Mutual Recognition Act 1992* (MRA). (See https://www.employment.gov.au/mutual-recognition)

Non-ionising radiation	Electromagnetic radiation of a wavelength greater than 100 nanometres.
Non-ionising radiation apparatus	An apparatus that when energised produces non-ionising radiation, or when assembled or repaired is capable of doing so (e.g. laser surgery equipment).
Notification	A document submitted to the Authority to notify an intention to carry out a practice or any other dealing with radiation apparatus or radioactive material.
Nuclear installation[1]	This term has the same meaning as defined in section 13 of the *Australian Radiation Protection and Nuclear Safety Act 1998*.
Optimisation	The process of determining what level of protection and safety would result in the magnitude of individual doses, the number of individuals (workers and members of the public) subject to exposure and the likelihood of exposure being as low as reasonably achievable, economic and social factors being taken into account. (See also page 121 of IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary)
Planned exposure situation	Situations where radiation protection can be planned in advance, before exposures occur and where the magnitude and extent of exposures can be reasonably predicted.
Protection of the environment	Protection and conservation of: non-human species, both animal and plant, and their biodiversity; environmental goods and services such as the production of food and feed; resources used in agriculture, forestry, fisheries and tourism; amenities used in spiritual, cultural and recreational activities; media such as soil, water and air; and natural processes such as carbon, nitrogen and water cycles. (From page 57 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).
Radiation	See "ionising radiation" and "non-ionising radiation" above.
Radiation apparatus	An ionising radiation apparatus or a non-ionising radiation apparatus.
Radiation Health Committee (RHC)	A committee formed under section 22 of the *Australian Radiation Protection and Nuclear Safety Act 1998*. Subsection 23(1) lists the RHC's functions as follows: (a) to advise the CEO and the Council on matters relating to radiation protection (b) to develop policies and to prepare draft publications for the promotion of uniform national standards of radiation protection (c) to formulate draft national policies, codes and standards in relation to radiation protection for consideration by the Commonwealth, the States and the Territories (d) from time to time, to review national policies, codes and standards in relation to radiation protection to ensure that they continue to substantially reflect world best practice (e) to consult publicly in the development and review of policies, codes and standards in relation to radiation protection.

[1] Certain types of nuclear installations may be prohibited in Australian jurisdictions by government policy or other legislation.

Radiation incident	A radiation incident is any unintended or ill-advised event when using ionising radiation apparatus, specified types of non-ionising radiation apparatus or radioactive substances, which results in, or has the potential to result in, an exposure to radiation to any person or the environment, outside the range of that normally expected for a particular practice, including events resulting from operator error, equipment failure, or the failure of management systems that warranted investigation.
Radiation practice	Any human activity that introduces additional sources or exposure pathways or extends exposure to additional people or modifies the network of exposure pathways from existing sources, so as to increase the exposure or the likelihood of exposure of people or the number of people exposed to radiation. (See also page 129 of the IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).
Radiation risk	Detrimental health effects of exposure to ionising radiation including the likelihood of such effects occurring, and other risks including environmental risks, that might arise from exposure to ionising radiation, the presence of radioactive material (including radioactive waste) or its release to the environment, or a loss of control over a nuclear reactor core, nuclear chain reaction, radioactive source or any other source of radiation; alone or in combination. For non-ionising radiation it means health effects and health risks associated with acute or prolonged exposure to non-ionising radiation such as ultraviolet radiation, radiofrequency radiation, optical radiation and other types of non-ionising radiation, either in occupational settings or as members of the public.
Radiation source	Anything that may emit ionising radiation or non-ionising radiation.
Radioactive material	Any material that emits ionising radiation spontaneously.
Reference level	For an emergency exposure situation or an existing exposure situation, the level of dose, risk or activity concentration above which it is not appropriate to plan to allow exposures to occur and below which optimisation of protection and safety would continue to be implemented.
Registration	An authorisation by the Authority for a radiation apparatus or sealed source apparatus, or for premises in which radiation sources are used.
Responsible person	'Responsible Person' in relation to any radioactive source, ionising or non-ionising radiation apparatus, nuclear installation, prescribed radiation facility or premises on which unsealed radioactive sources are stored or used means the person: • having overall management responsibility including responsibility for the security and maintenance of sources, apparatus, installations or facilities • having overall control over who may use the source or apparatus, installation or facility • in whose name the source, apparatus, installation or facility, would be registered if this is required.

Safety assessment	Assessment of all aspects of facilities and activities that are relevant to protection and safety. For an authorized facility, this includes siting, design and operation of the facility. This will normally include risk assessment. (See also page 12 of IAEA Safety Glossary 2016 available at https://www.iaea.org/resources/safety-standards/safety-glossary).
Sealed source	Radioactive material that is permanently sealed in a capsule, or closely bound and in solid form.
Sealed source apparatus	An apparatus that produces ionising radiation by virtue of the fact that it contains radioactive material in the form of a sealed source.
Tanning unit	An electrically powered appliance or installation intended to produce tanning of the human skin by utilising ultraviolet radiation.