



Australian Government

Australian Radiation Protection
and Nuclear Safety Agency



Australian National Radiation Dose Register

Implementation of an NDR in Australia

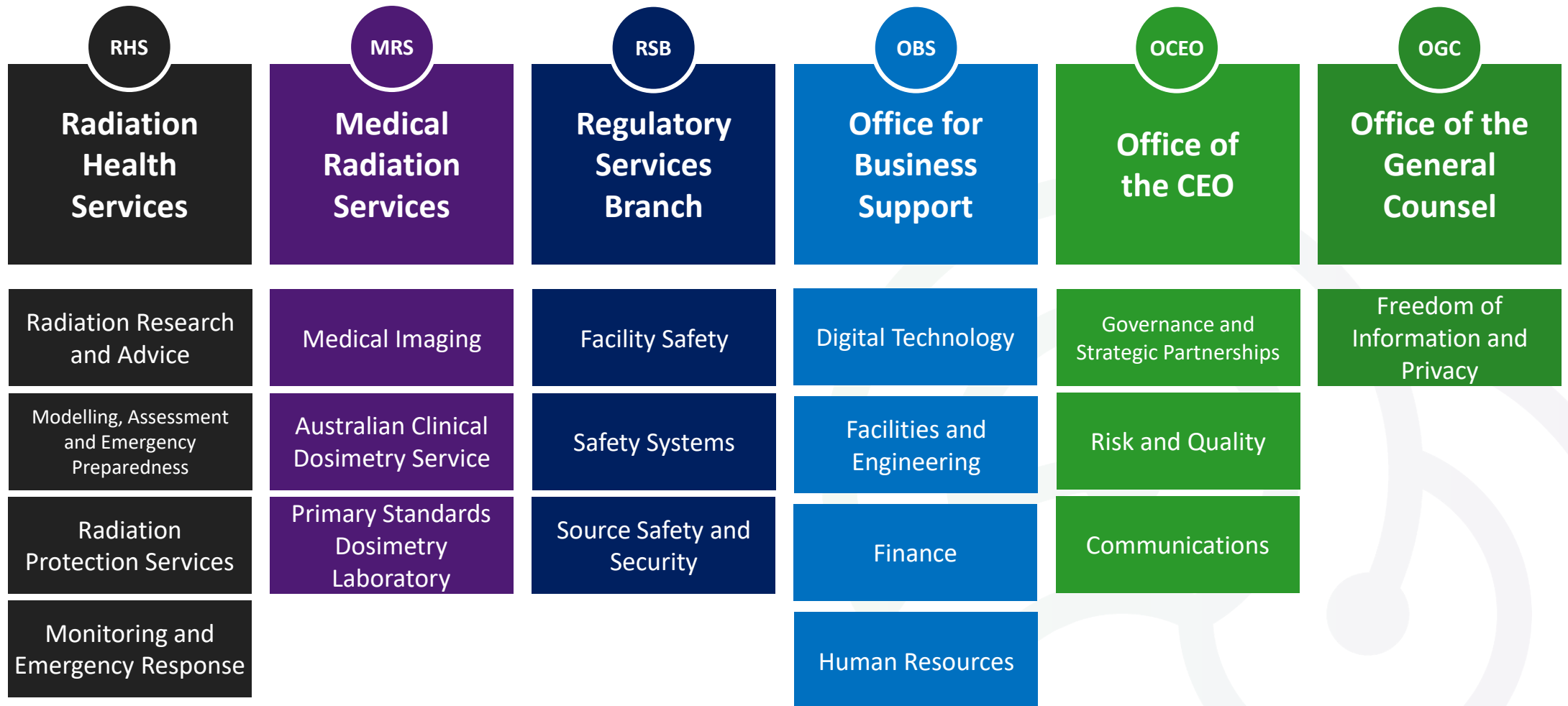
Overview

- Introduction to ARPANSA
 - Australian radiation protection framework
 - ANRDR overview
 - New portal for dosimetry service provider (DSP) submissions
 - Dose history report
 - Worker outreach program
 - Privacy
 - Challenges, next steps and final thoughts
- 

We are the Australian Government's
primary authority on
**radiation protection
and nuclear safety**

**Our purpose is to
protect the Australian
people and the
environment from the
harmful effects of
radiation**

Our business areas



Radiation Health Services



Modelling, Assessment and Emergency Preparedness Section

Assessing the levels and health risks of radiation exposure from natural and artificial sources to people and the environment; Providing leadership in Emergency Preparedness & Response



Specialists in dose and risk assessment for planned, existing and emergency exposure situations



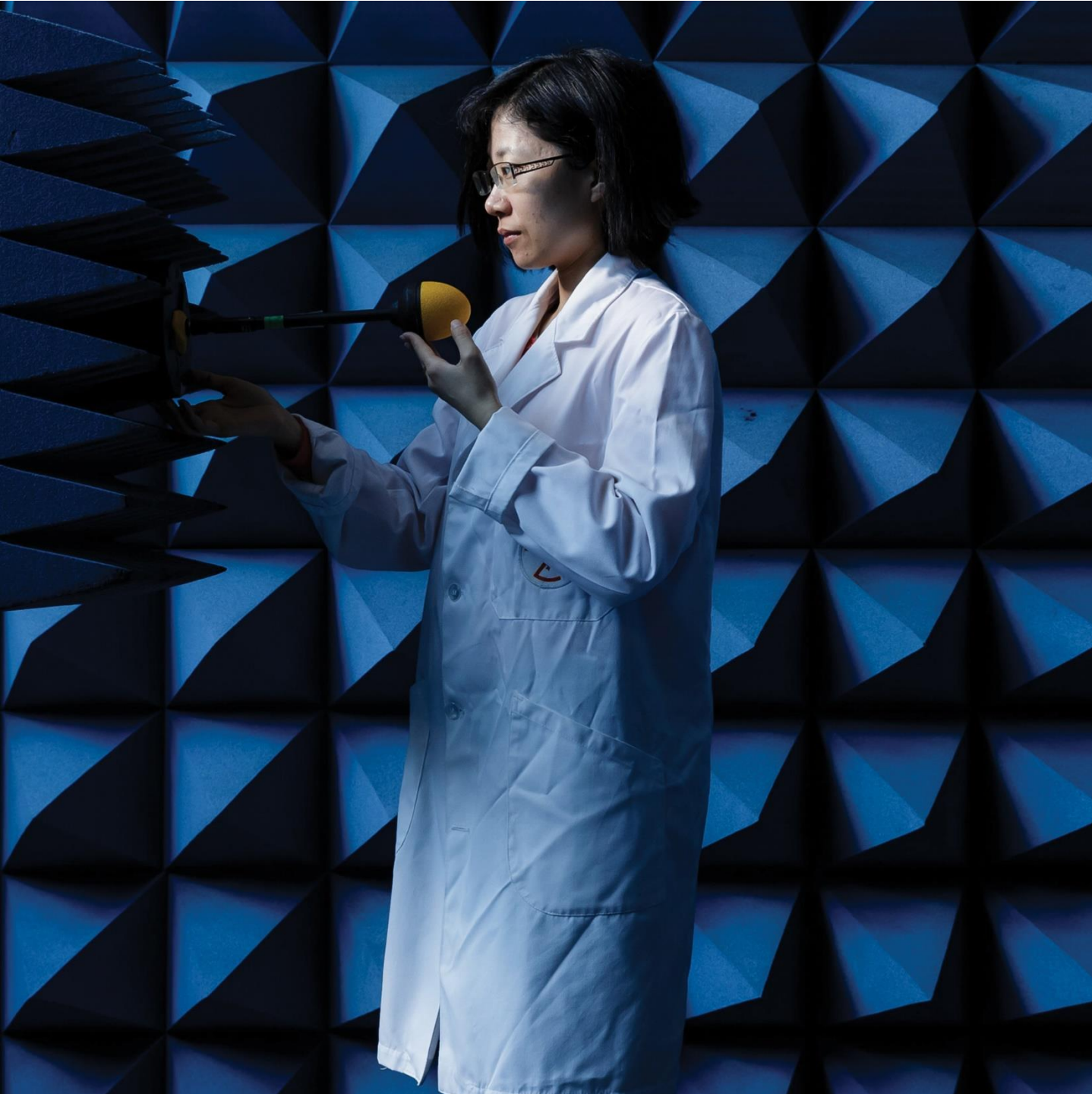
Maintain expertise in modelling radiation exposures and doses to people and the environment



Strategic development of Australia's emergency preparedness for nuclear and radiological events; coordination of ARPANSA's response



Maintenance and expansion of the Australian National Radiation Dose Register (ANRDR)



Australian National Radiation Dose Register

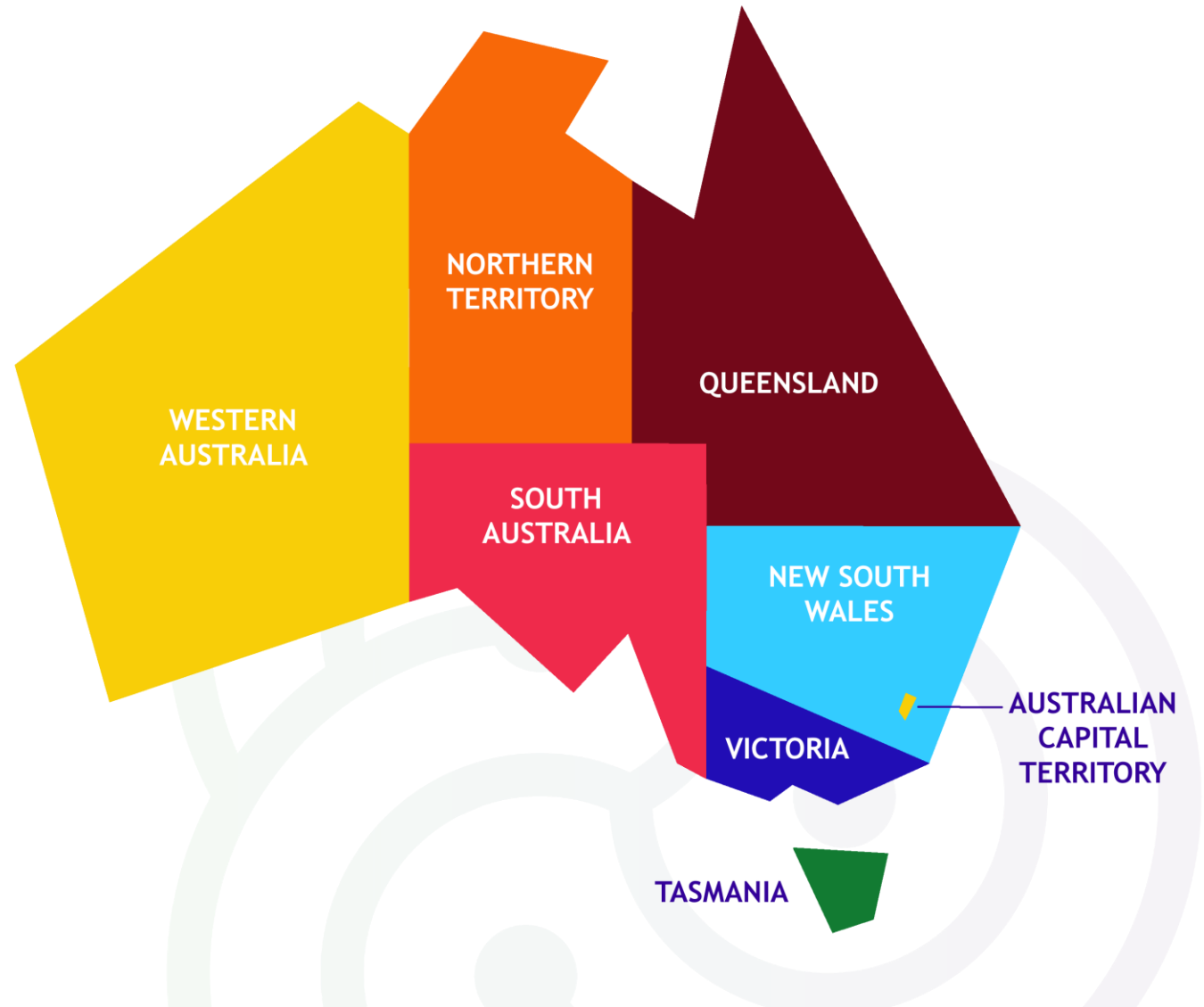
The ANRDR is a database of radiation doses to Australian workers. This centralised database allows workers to keep track of their doses as they move from workplace to workplace, and monitors for dose limit exceedances.

Australian radiation protection framework



Australian context

- Australia is a federal system of 8 States and Territories
- Each State and Territory has its own radiation regulator
- ARPANSA regulates the Commonwealth
- ARPANSA operates in all States and Territories
- ARPANSA provides leadership for national uniformity



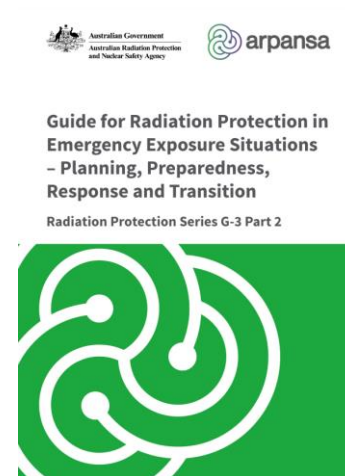
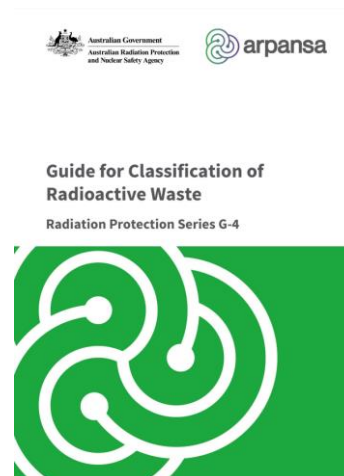
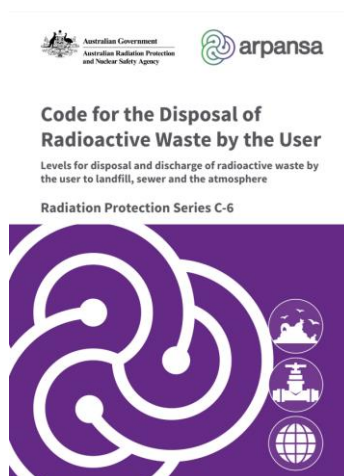
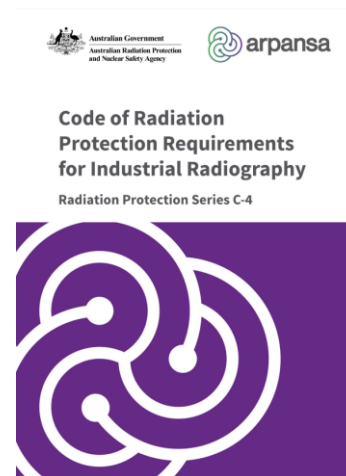
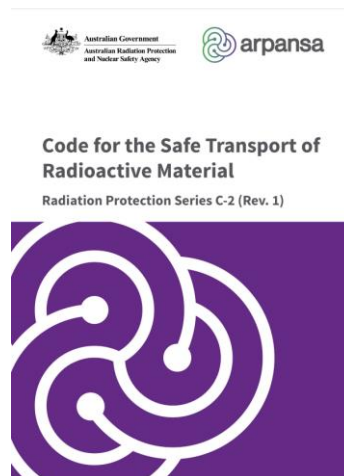
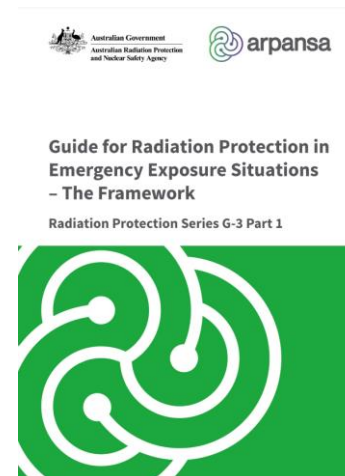
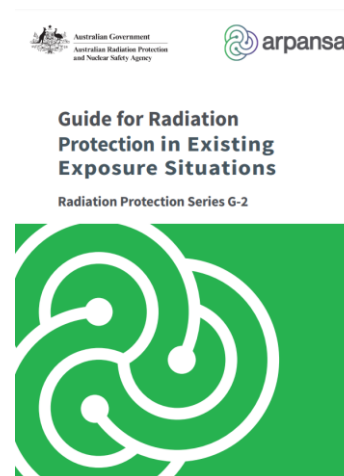
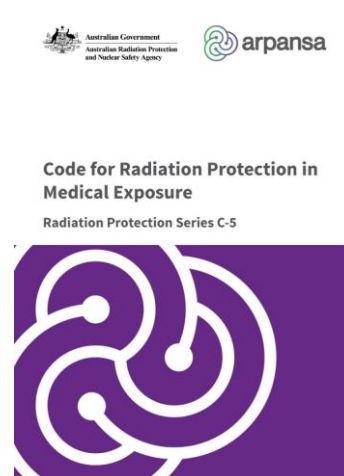
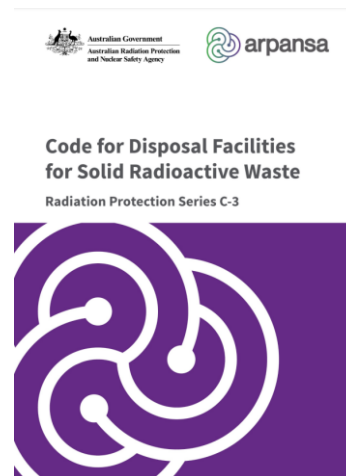
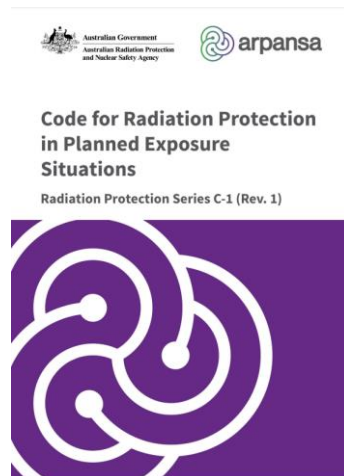
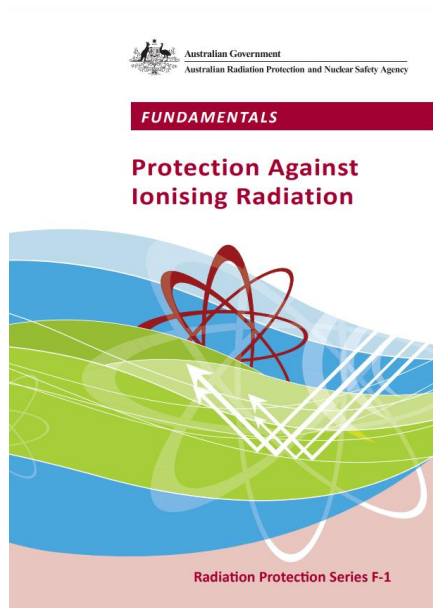
International best practice

Exposure records for each worker shall be maintained during and after the worker's working life, at least until the former worker attains or would have attained the age of 75 years and for not less than 30 years after cessation of the work in which the worker was subject to occupational exposure.

IAEA, 2014. Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3, Section 3.104.

How are international standards brought into Australia?





ANRDR

Overview



ANRDR background

- Originally established in 2010 for the uranium mining industry – complete coverage in 2011
- Expanded to all industries, but limited uptake
- Based on *voluntary* participation for most industries
- Mandatory only for uranium industry and ARPANSA licence holders (Commonwealth organisations)
- Achieved by amending *licence conditions or legislation*
- ‘Submission by employer’ model has significant drawbacks and has seen a limited uptake of the program
- State regulators do not have resources to enforce compliance for thousands of licence holders

ANRDR objectives

The objectives of the ANRDR are to:

- ensure dose records for all workers are consolidated and easily accessible for them
- identify and promptly communicate dose limit exceedances to the employer and regulator for workers who have changed jobs or have more than one employer
- provide employers with access to their workers' dose records for their current employment through the ANRDR as a free record management tool
- produce industry and occupation-specific statistics for occupational exposures
- provide regulators with oversight of all exposures in their jurisdiction, including statistical breakdowns
- allow dosimetry service providers to submit dose records easily to the ANRDR
- remain flexible to adapt to accessibility expectations for all stakeholders
- meet international best practice for the long-term storage and maintenance of dose records in a national register

ANRDR in numbers



More than

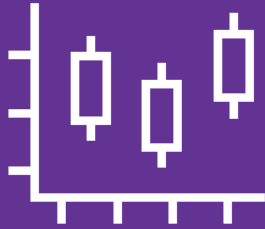
50 000

individual dose records in the ANRDR going back 30 years

Estimated to be more than

80 000

radiation workers in Australia today – only a small portion are being captured in the ANRDR



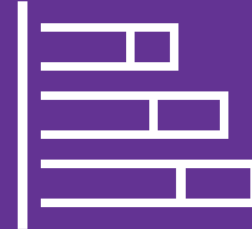
The average dose of workers last year was

0.54 mSv



81%

of workers had a dose of **<1 mSv** last year



Highest dose recorded last year was

6.63 mSv



93

dose history requests received last year

Accreditation Standard for DSPs

- Use of personal radiation monitors is a legislated requirement in all jurisdictions in Australia. Despite this, there is no nationally implemented accreditation process for DSPs. Identified as a potential regulatory and health risk
- Lack of accreditation identified as an area for improvement by the IAEA Integrated Regulatory Review Service (IRRS) mission to Australia in 2017 – peer review of Australian regulatory framework
- A single Standard recognised by all jurisdictions
- Accreditation Scheme (framework) to be developed later
- Currently awaiting consultation process
- **Requirement on DSPs for data submission to the ANRDR**



Advisory Board

- Established in 2019 to advise ARPANSA on ANRDR matters
- Fully independent
- Consists of state/territory regulatory representatives
- Agenda driven by ARPANSA
- Ownership of ANRDR strategic direction



New model: DSP submissions

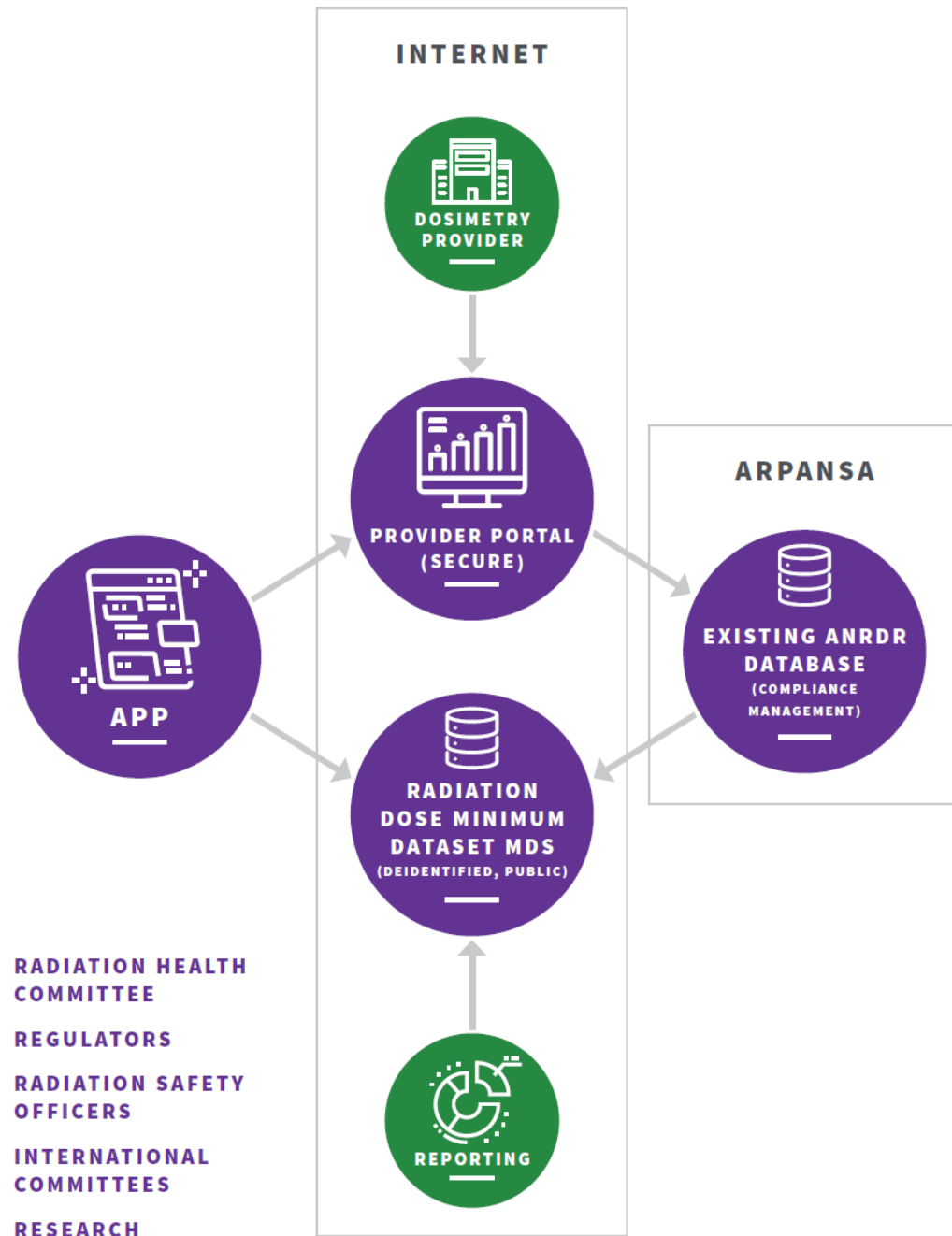
- On direction from the Advisory Board, the ANRDR is changing its model from employer submissions to dosimetry service provider (DSP) submissions
- Only way to achieve full coverage – how we measure success
- Reduces the burden on employers/regulators (1000s of employers vs 4 DSPs)
- International best practice – successful models in Canada and Europe
- **Requirement in the new DSP Accreditation Standard**

New portal for dosimetry service submissions



Conceptual design of the provider portal

Demonstrates the position of the portal as part of the overall structure of the ANRDR



Data Transfer Specifications

Provides requirements and guidance to dosimetry service providers for the provision of dose records to the ANRDR

Annex contains submission file and response file examples



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Australian Radiation Protection
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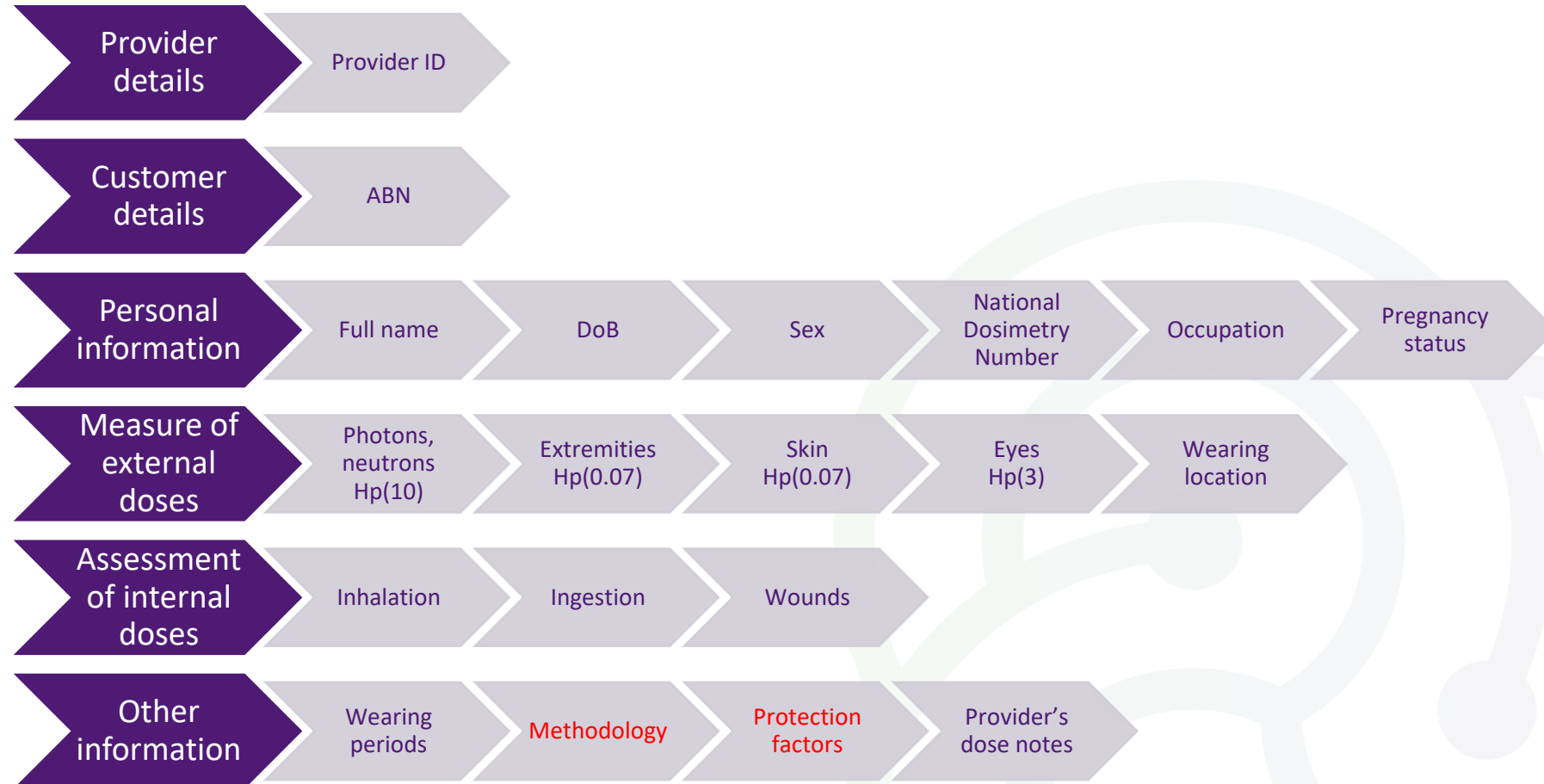
National Dosimetry Service Dataset

Provider Portal

Data Transfer Specifications



Information we collect

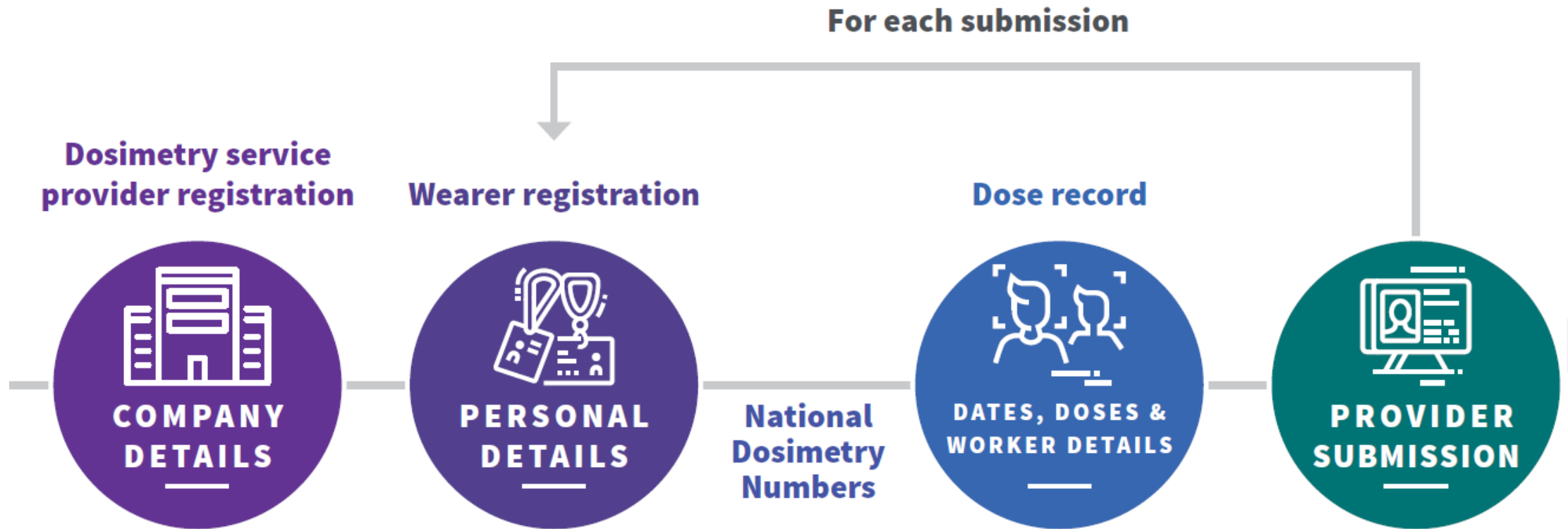


Code	Industry	Occupations
101	Mining	Mineral sands – mine
102	Mining	Mineral sands – wet plant
103	Mining	Mineral sands – dry plant
104	Mining	Mineral sands – other
105	Mining	Uranium – mine underground
106	Mining	Uranium – mine open cut
107	Mining	Uranium – mine in situ
108	Mining	Uranium – processing
109	Mining	Uranium – other
201	Medical	Diagnostic radiology – radiographers
202	Medical	Diagnostic radiology – radiologists
203	Medical	Diagnostic radiology – interventional
204	Medical	Diagnostic radiology – theatre nurses
205	Medical	Radiotherapy – radiation therapists
206	Medical	Radiotherapy – oncologists (brachytherapy)
207	Medical	Nuclear medicine – technologists
208	Medical	Nuclear medicine – specialists
209	Medical	Nuclear medicine – nurses
210	Medical	Nuclear medicine – other (PSAs)
211	Medical	Medical physicists – diagnostic imaging
212	Medical	Medical physicists – radiation oncology
213	Medical	Radiopharmaceutical production workers
214	Medical	Chiropractic
215	Medical	Dental
301	Government	Scientific research
302	Government	Police, security, Defence and border protection
303	Government	Nuclear installations and prescribed radiation facilities
304	Government	Other source licence holders
305	Government	Regulatory authority (inspectors)
401	Research	Medical
402	Research	Industrial
501	Industry	Industrial radiography
601	Veterinary	Practice
602	Veterinary	Research
701	Aviation	Cabin crew
702	Aviation	Technical crew (pilots)
703	Aviation	Other

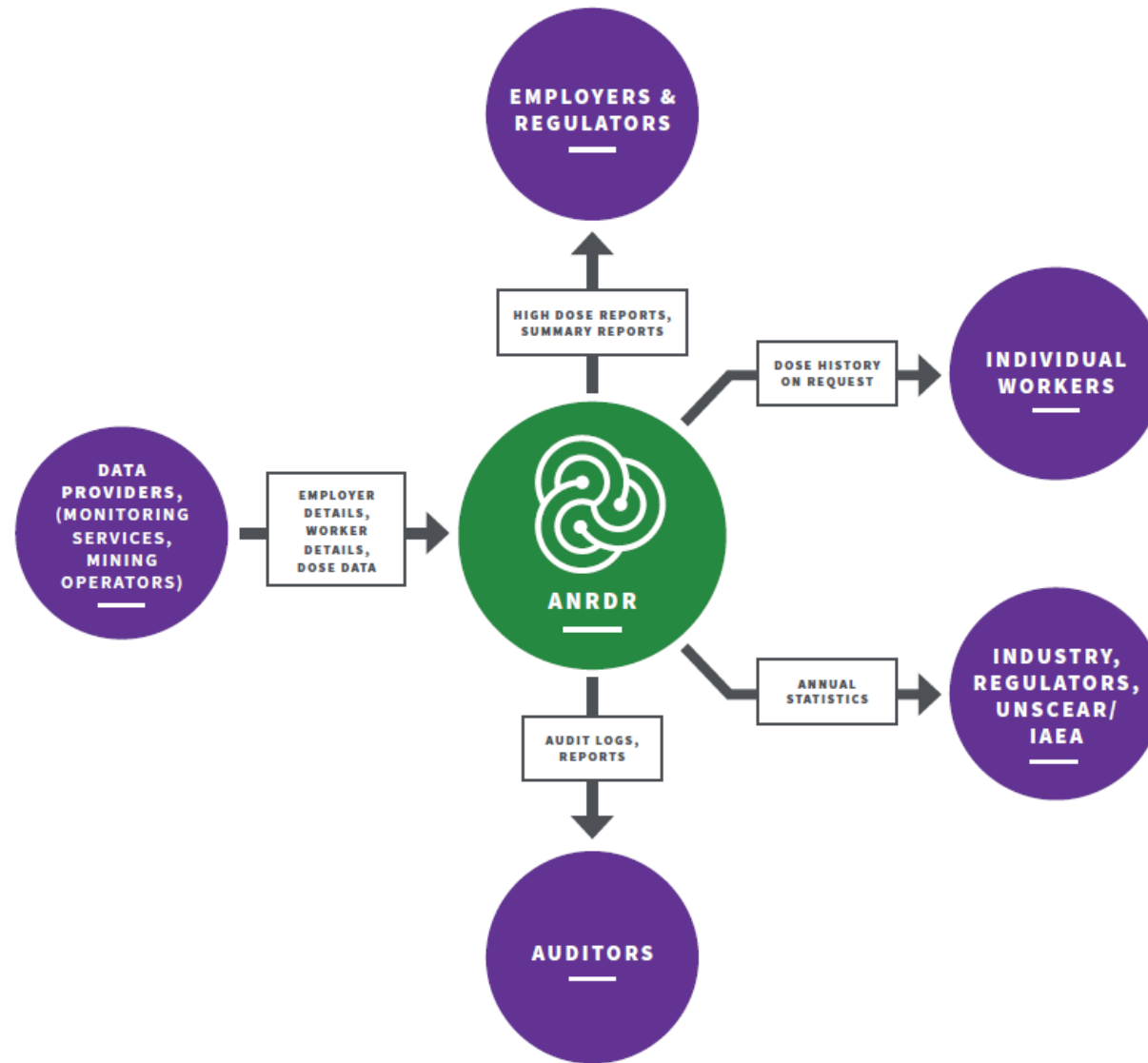
List of occupational categories



Registration and submission process



Information flow



Dose history report



ANRDR dose history report

AUSTRALIAN NATIONAL RADIATION DOSE REGISTER

619 Lower Plenty Road, Yallambie, Victoria 3085 Phone: (03) 9433 2211 Fax: (03) 9432 1835 E-mail: ANRDR@arpansa.gov.au

Total Effective Dose Reported to the ANRDR for CAMERON LAWRENCE (ANRDR Registration No. 1451)

Year	Annual Total Effective Dose (mSv/year)	Five Year Average Annual Effective Dose (mSv/year)
2007	1.36	-
2008	1.27	-
2009	0.69	-
2010	0.45	-
2011	0.44	0.84
2012	N/A	0.57
2013	N/A	0.31
2014	N/A	0.18
2015	N/A	0.09
2016	N/A	-
2017	N/A	-

ANRDR dose history report

Reporting Group Details

Company Identifier	Company Name
1001	BHP Billiton Olympic Dam

Detailed ANRDR Dose Records

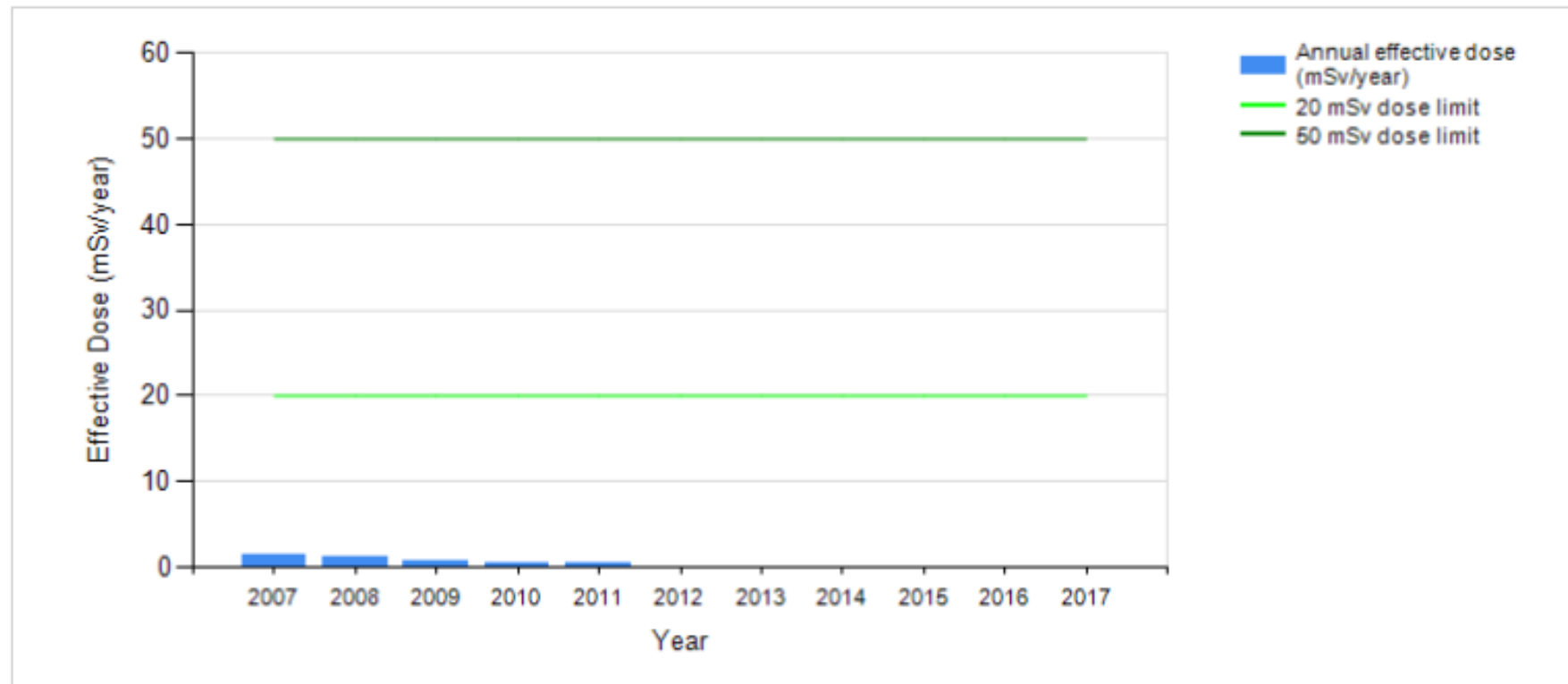
for CAMERON LAWRENCE (ANRDR Registration No. 1451)

Period	Company ID	Company Name	Dose Type	Dose Situation	Dose (mSv)	
2007 Apr-Jun	1001	BHP Billiton Olympic Dam	Gamma	Occ.	0.09	
			Particle	Occ.	0.06	
			Rn-222	Occ.	0.09	
2007 Jul-Sep	1001	BHP Billiton Olympic Dam	Gamma	Occ.	0.19	
			Particle	Occ.	0.55	
			Rn-222	Occ.	0.11	
2007 Oct-Dec	1001	BHP Billiton Olympic Dam	Gamma	Occ.	0.10	
			Particle	Occ.	0.07	
			Rn-222	Occ.	0.11	
2008 Apr-Jun	1001	BHP Billiton Olympic Dam	Gamma	Occ.	0.10	
			Particle	Occ.	0.21	
			Rn-222	Occ.	0.21	

ANRDR dose history report

Annual Effective Dose Limits

- 20 mSv per year, averaged over a period of five consecutive calendar years [1]
- 50 mSv in any single year



Monitoring service report



Australian Government
Australian Radiation Protection
and Nuclear Safety Agency



Whole body photon (OSL) dose report summary

Summary of monitors in this report

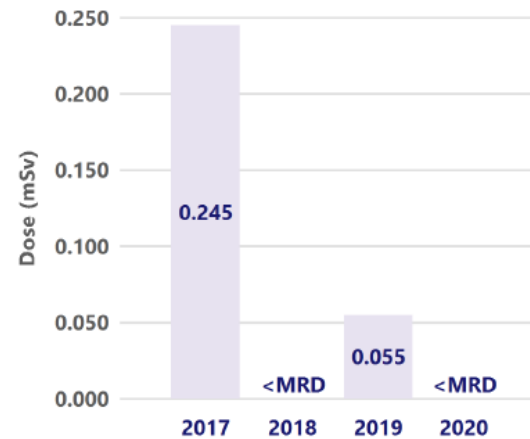
Number of monitors returned	Number of wearers with doses $\geq$ MRD*
4	1
Average dose of all wearers*	Highest wearer dose*
0.15 mSv	0.30 mSv
Number of monitors not returned for your centre, including lost monitors: 0	

How do you compare with your industry?

Your centre's annual average dose $\geq$ MRD*	National annual average wearer dose for Veterinary
0.20 mSv	0.06 mSv

*This dose relates to the photon Hp(10) column in the dose report breakdown table for worn monitors

Your centre's average annual Hp(10) doses over time



Annual dose limit
20
mSv

Average annual exposures to natural background in Australia
1.5
mSv



NATA Accredited Laboratory
Number: 14442

Accredited for compliance with ISO/IEC 17025 - testing.
The results of the tests, calibrations and/or measurements included in this document are traceable to national standards.

This document shall not be reproduced except in full.

Stephen Marks
Assistant Director, PRMS
ARPANSA
619 Lower Plenty Road
Yallambie VIC 3085 AUSTRALIA

Monitoring service report

Whole body photon (OSL) dose report breakdown

Centre number: **5095**

Report number: **109**

Report date: **24.06.2021**

Monitor Number	Wearer ID	Name	Actual Wearing Period		Monitor photon dose		Wearer dose last 12 months	
			From	To	Hp(0.07)	Hp(10)	Hp(0.07)	Hp(10)
V2036-38979	142011	BUICK, Lisa M	07.09.2020	29.11.2020	>6mths	>6mths	0.34 mSv	0.30 mSv
V2108-00055		CONTROL	22.02.2021	16.05.2021				
V2108-00056	142011	BUICK, Lisa M	22.02.2021	16.05.2021	0.34 mSv	0.30 mSv	0.34 mSv	0.30 mSv
V2108-00057	40023	JOHNSON, G N	22.02.2021	16.05.2021	<MRD	<MRD	<MRD	0.11 mSv

Key

- <MRD: The result has not been reported as it is less than the Minimum Reportable Dose, MRD.
- >6mths: This monitor was not reported due to being despatched for longer than 6 months.

Worker Outreach Program



Worker outreach program

The ANRDR team takes a holistic approach to stakeholder engagement by providing support, advice and education on the ANRDR and other radiation protection matters. The outreach program consists of **posters, brochures, PowerPoint slides, and registration certificate.**

The purpose of the worker outreach program is to:

- **Educate** worker on the existence, purpose and benefits of the ANRDR
- **Encourage** workers to periodically request their personal dose history reports
- **Empower** workers to take a proactive approach in optimising radiation protection in their workplace



Australian National Radiation Dose Register

Certificate of Registration

Congratulations, you've been registered! Your occupational exposure records are being stored and maintained in the Australian National Radiation Dose Register (ANRDR).

Your employer has provided us with the following details:

Name	Ben Paritsky
ANRDR no.	12345
Gender	M
DOB	01/01/1901

Please retain this certificate as it contains your unique ANRDR number, which identifies you in our database.

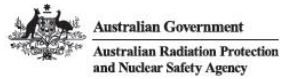
You can use your ANRDR number to link and track your radiation dose records throughout your career.

To ensure your records are linked if you change jobs, please provide your ANRDR number to any employer who monitors you for occupational exposure to ionising radiation.

Request your free report

The ANRDR is here to make sure you know your doses. To help keep track, you can [request your free personal dose history report](#) from ARPANSA.

Poster series

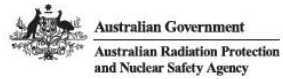


The ANRDR is working
with your employer to
maintain your dose history.

Find out more about the **Australian National Radiation Dose Register**
and request your free dose history report.

arpansa.gov.au/ANRDR

1800 022 333



When was the last time you
requested **your radiation
dose history?**

Find out more about the **Australian National Radiation Dose Register**
and request your free dose history report.

arpansa.gov.au/ANRDR

1800 022 333



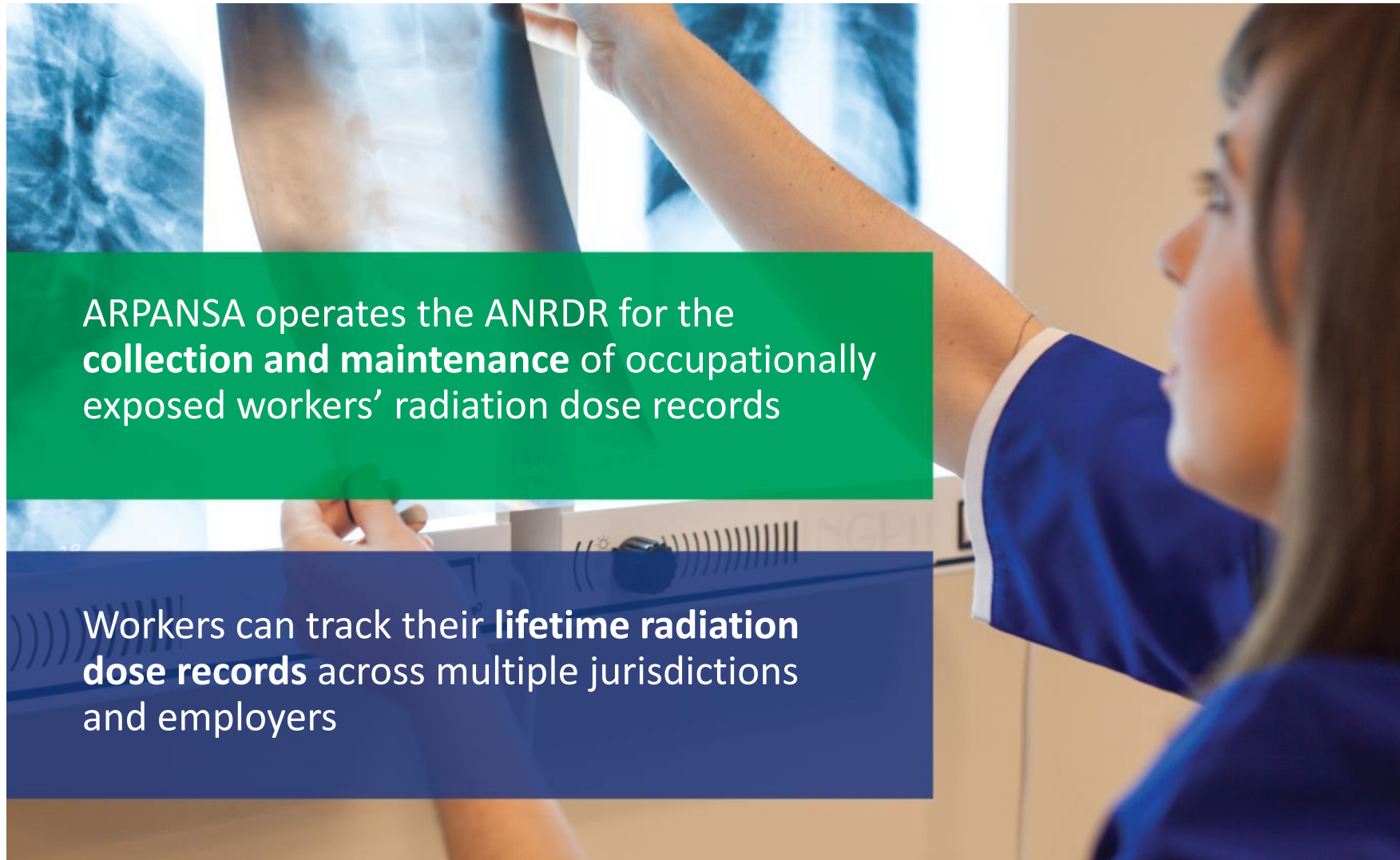
The ANRDR can track your
radiation dose history,
even if you change jobs.

Find out more about the **Australian National Radiation Dose Register**
and request your free dose history report.

arpansa.gov.au/ANRDR

1800 022 333

PowerPoint slide 1



ARPANSA operates the ANRDR for the **collection and maintenance** of occupationally exposed workers' radiation dose records

Workers can track their **lifetime radiation dose records** across multiple jurisdictions and employers

PowerPoint slide 2

The background of the slide features a close-up photograph of a person's hand holding a smartphone. The phone's screen displays several circular medical scan images, likely CT or MRI slices of a human head. The image is partially obscured by three horizontal, semi-transparent colored bars (purple, pink, and orange) that contain text. A large, faint, light-grey circular graphic is visible on the right side of the slide.

The ANRDR collects **personal, organisational and dose information** from your monitoring service

Workers can request their **personal dose history report** from the ANRDR

The ANRDR produces **exposure statistics and trends** for industries and workgroups in an annual newsletter

Privacy



Privacy considerations

Australian Privacy Principles (APPs)

- Are the cornerstone of the privacy protection framework in the Privacy Act
- Provide guidance on how personal information can be used

Privacy Policy

- A statement that explains in simple language how an organisation handles personal information

Privacy Impact Assessment

- Demonstrates compliance with the APPs
- Not mandatory but considered good practice, particularly for new projects that involve personal information

ARPANSA Privacy Policy – ANRDR section

Maintaining registers

Australian National Radiation Dose Register

The [Australian National Radiation Dose Register](#) (Dose register) is an electronic database that is designed to store and maintain radiation dose records for workers who are occupationally exposed to radiation. The Dose register is maintained and managed by ARPANSA. The data is provided by registered employers in applicable industries on a quarterly basis. The data includes names, dates of birth, gender, employee (payroll) numbers and employee work classifications.

Workers can [request a copy of their radiation dose history](#) from ARPANSA.

Access to the ANRDR is restricted to ANRDR administrators and records are accessed only when needed. The Privacy Statement and Privacy Impact Assessment for the ANRDR is available on [ARPANSA'S website](#).

Australian Privacy Principles — a summary for APP entities

from 12 March 2014



Australian Government
Office of the
Australian Information Commissioner

APP 1 — Open and transparent management of personal information

Ensures that APP entities manage personal information in an open and transparent way. This includes having a clearly expressed and up to date APP privacy policy.

APP 2 — Anonymity and pseudonymity

Requires APP entities to give individuals the option of not identifying themselves, or of using a pseudonym. Limited exceptions apply.

APP 3 — Collection of solicited personal information

Outlines when an APP entity can collect personal information that is solicited. It applies higher standards to the collection of 'sensitive' information.

APP 4 — Dealing with unsolicited personal information

Outlines how APP entities must deal with unsolicited personal information.

APP 5 — Notification of the collection of personal information

Outlines when and in what circumstances an APP entity that collects personal information must notify an individual of certain matters.

APP 6 — Use or disclosure of personal information

Outlines the circumstances in which an APP entity may use or disclose personal information that it holds.

APP 7 — Direct marketing

An organisation may only use or disclose personal information for direct marketing purposes if certain conditions are met.

APP 8 — Cross-border disclosure of personal information

Outlines the steps an APP entity must take to protect personal information before it is disclosed overseas.

APP 9 — Adoption, use or disclosure of government related identifiers

Outlines the limited circumstances when an organisation may adopt a government related identifier of an individual as its own identifier, or use or disclose a government related identifier of an individual.

APP 10 — Quality of personal information

An APP entity must take reasonable steps to ensure the personal information it collects is accurate, up to date and complete. An entity must also take reasonable steps to ensure the personal information it uses or discloses is accurate, up to date, complete and relevant, having regard to the purpose of the use or disclosure.

APP 11 — Security of personal information

An APP entity must take reasonable steps to protect personal information it holds from misuse, interference and loss, and from unauthorised access, modification or disclosure. An entity has obligations to destroy or de-identify personal information in certain circumstances.

APP 12 — Access to personal information

Outlines an APP entity's obligations when an individual requests to be given access to personal information held about them by the entity. This includes a requirement to provide access unless a specific exception applies.

APP 13 — Correction of personal information

Outlines an APP entity's obligations in relation to correcting the personal information it holds about individuals.

www.oaic.gov.au

For private sector organisations,
Australian Government
and Norfolk Island agencies
covered by the *Privacy Act 1988*

Privacy impact assessment

4.6. APP6 Use or Disclosure of Personal Information

Use or Disclosure of Personal Information		Y	N	APP
4.6.1	Is the information only used or disclosed for the primary purpose of collection?	X		6.1
4.6.2	Have individuals consented to the disclosure of the information?		X	6.1
4.6.3	Is the information used or disclosed for a secondary purpose?	X		6.2
4.6.4	Is the personal information biometric?		X	6.3
4.6.5	Is the purpose of disclosure of information provided?	X		6.5
4.6.6	Is personal information disclosed for marketing purposes?		X	6.7
4.6.7	Are government related identifiers disclosed?		X	6.7

The ANRDR's primary purpose is for the storage and maintenance of dose records in a central location, which is consistent with ARPANSA's objective to protect people from the harmful effects of radiation. Disclosure of dose records from the ANRDR to the individual, employer or relevant state, territory or Commonwealth regulator is one of the ANRDR's primary functions and permitted under APP 6.2 (a)(i).

Personal information

The ANRDR collects minimal personal information about individuals:

- Full name
- Date of birth
- Sex
- National Dosimetry Number
- Occupation

This is necessary to:

- Make sure doses are attributed to the correct individuals and can be tracked throughout their lifetime
- Identify individuals when they request their dose history
- Report dose limit exceedances to the regulator
- Categorise doses by occupation for data analysis

**Challenges,
next steps and
final thoughts**



Challenges

- Privacy as a *perceived* risk
 - Minimal personal information for identification purposes
 - Dose records are **not** classified as health or sensitive information
 - Compliant with the Australian Privacy Principles (Privacy Act)
 - Privacy Policy (mandatory) and Privacy Impact Assessment (voluntary but good practice)
 - Submission of dose records is part of the primary purpose of collection
 - Benefits greatly outweigh the risks (compared with social media, online shopping, etc.)
- Until now, no legal mechanism to mandate dosimetry service providers to provide their customers' data. Accreditation Scheme will close this gap in legislation
- Electronic personal dosimeters and new technologies
- Aviation industry (highest doses but not radiation workers; modelling software)
- Historical dose records (poor data quality, missing information)

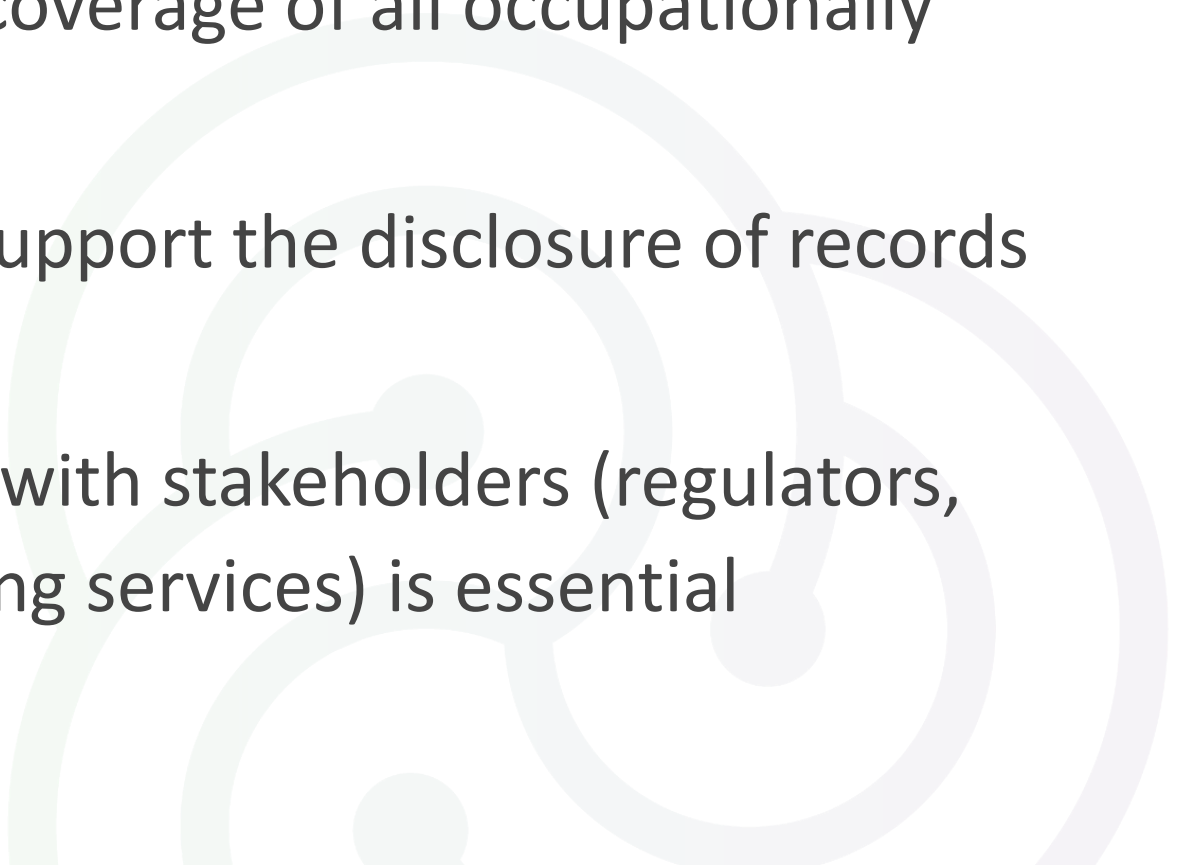


Next steps

- Work with monitoring services to upload their data to the ANRDR (workshop held last year discussed legal and technical aspects)
- Develop a new dose history report that is modern, relevant and user-friendly
- Develop an app for workers to access and download their dose history reports



Final thoughts

- An NDR is an important part of a radiation protection framework
 - An NDR needs to have complete coverage of all occupationally exposed workers to be successful
 - The regulatory framework must support the disclosure of records to the NDR
 - Engagement and communication with stakeholders (regulators, employers, workers and monitoring services) is essential
- 

Thank you

anrdr@arpansa.gov.au

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