

National Strategy for Radiation Safety

Implementation Plan

National Strategy Context¹

Radiation, comprising ionising and non-ionising electromagnetic radiations and particulate radiations, are widespread throughout the environment. Radiation can be natural or manufactured, and may take the form of ionising or non-ionising emissions. Radiation sources have many beneficial uses across a range of industries. Radiation sources are fundamental to the operation of the health sector for a range of diagnostic and therapeutic procedures, and the majority of users of radiation in the health sector where they are involved in the diagnostic or therapeutic uses of radiation. Radiation sources are also used in the industrial, mining and manufacturing sectors, the agriculture sector, and in power generation. The telecommunications sector employs non-ionising radiation in the form of radio waves and lasers, as does the cosmetic and beauty therapy sector. Radiation sources are also used in scientific research and teaching, as well as in a range of consumer products.

Despite their beneficial applications, many radiations are hazardous, and their use must be regulated to ensure the risks are properly managed to minimise impacts on the health and safety of people and the environment. The radiation risks to workers, the public and to the environment that may result from these applications must be assessed and managed where necessary. It is because of these risks that activities such as the medical uses of radiation, the operation of nuclear installations, the production, transport and use of radioactive materials, the installation of telecommunications equipment and the management of radioactive waste must be subject to regulation, control, and standards of safety.

In Australia, it is the responsibility of each jurisdiction to regulate radiation and each jurisdiction has its own radiation safety legislation and regulatory body. However, radiation risks may go beyond jurisdictional borders. Consequently, there can be overlap, duplication and inconsistencies across radiation safety legislative frameworks. Jurisdictions work together to promote and enhance safety, both nationally and internationally, by exchanging experiences and by improving jurisdictions' capabilities to control hazards, to prevent incidents, to respond to emergencies and to mitigate any harmful consequences.

The international safety standards with which Australia complies:

- assist Australia in meeting its obligations to protect people and the environment
- promote and assure confidence in safety
- facilitate interjurisdictional and international commerce and trade.

As a member state of international organisations, a contracting party to international and regional conventions, and as an active participant in international advisory and scientific committees, Australia is a long-standing and influential contributor to the development and implementation of international safety standards for radiation protection and the assessment and management of radiation-related risks.

¹ Adapted from IAEA GSR Part 1 (Rev 1)

A reform agenda for radiation safety in Australia

As noted in the National Strategy for Radiation Safety (the National Strategy), Australia has a long history of successfully managing the use of radiation across many sectors. However, Australia's radiation safety system also presents a number of challenges, to both businesses and regulators.

The responsibility for radiation regulation in Australia is on a jurisdictional basis, and this has contributed to some regulatory inconsistencies across jurisdictions. Our large-scale radiation emergency preparedness and incident response framework is untested and there are concerns as to whether it is fit for purpose. The developments in technology and scope of use of radiation tend to be faster than the radiation regulatory framework's capability to respond so, at times, new technologies may not be adequately regulated. Furthermore, while each jurisdiction has effective mechanisms in place to manage radioactive material at all stages of its life cycle, there is presently no nationally agreed framework for the management of radioactive materials, or radiation sources more generally, that have reached the end of their useful life.

National consistency of radiation protection outcomes is promoted through the *National Directory for Radiation Protection* (NDRP). The NDRP, which Australian Health Ministers originally agreed be developed in 1999, was established to provide an agreed framework for radiation safety and protection, including both ionising and non-ionising radiations, together with clear regulatory statements to be adopted by the Commonwealth, states and territories.

A second edition of the NDRP (NDRP2) has recently been endorsed by Australia's Health Ministers, with the Commonwealth, states and territories agreeing to work towards achieving the vision of a seamless regulatory framework for the safe generation and use of radiation across Australia. NDRP2 facilitates work to achieve this vision by providing a national framework for management of radiation risks to people and to the environment, and by promoting mutual recognition of authorisations issued under radiation safety legislation.

The National Strategy is an opportunity to further the important work already done by Australian governments and regulators by providing a national policy overlay to ensure the implementation of radiation safety and protection standards across jurisdictions is nationally consistent.

The National Strategy will be supported by an intergovernmental agreement (IGA) on radiation protection standards and regulation. The IGA will formalise jurisdictions' commitment to work towards achieving the aim of delivering a comprehensive radiation safety system for Australia that continues to protect people and the environment from the harmful effects of radiation. This aim will be achieved by providing consistent standards of protection, while maximising the benefits that can be provided by technologies that use radiation to ensure the best possible public health outcomes for the community.

The Australian Health Protection Principal Committee (AHPPC) will oversee the National Strategy via its Standing Committee on Environmental Health (enHealth), which comprises officials from the Commonwealth, state and territory governments. enHealth will drive and monitor the implementation of initiatives and review the effectiveness of the National Strategy.

Challenges

The National Strategy for Radiation Safety is a long-term plan that formalises not only the existing elements of Australia's radiation safety framework and drives national consistency and equity within that framework, but also provides the foundation upon which many associated challenges can be addressed.

The National Strategy identifies actions to make the framework more responsive to change, while acknowledging there are still a number of challenges jurisdictions face in protecting human health and the environment from harmful effects of radiation. These additional challenges include:

- creating a culture that includes and expects individuals and businesses involved in the use of radiation to share in setting goals and achieving outcomes under this strategy;
- keeping pace with evolving technologies (for example, proton therapy in the medical industry) to ensure the continued protection of the public and the environment from the harmful effects of radiation without stifling innovation;
- engaging with the community to improve the understanding and perceptions of the various uses of radiation, and its associated benefits and risks;
- understanding and monitoring the environmental impacts of radiation, including the management of existing exposures;
- ensuring safety in the use of non-ionising radiation sources, including telecommunications and the various non-ionising radiation sources used in the cosmetic industry;
- addressing regulatory workforce issues;
- improving public perceptions of risk associated with the increasing use of electromagnetic radiations and other non-ionising radiation sources; and
- ensuring radiation apparatus purchased over the internet meet Australian standards, and users of such apparatus do so in compliance with the relevant statutory frameworks;
- managing radiation sources at the end of their useful lives;
- meeting national and jurisdictional expectations for regulatory efficiency and minimising unnecessary business impact.

Australia's jurisdictions have undertaken to continue to work collaboratively to identify options to address these existing and emerging challenges in a consistent and mutually beneficial way.

The National Strategy

Objectives for change

It is important that Australia's framework for radiation safety and protection is responsive and adaptable, and maximises efficiencies for governments and businesses to ensure that all Australians continue to realise the benefits that can be provided by technologies that use radiation.

In November 2018, Australia hosted an International Atomic Energy Agency (IAEA) Integrated Regulatory Review Service (IRRS) mission. The IRRS mission is a peer review of a country's radiation safety regulatory framework benchmarked against IAEA safety standards. One of the recommendations of the IRRS mission was for Australia's jurisdictions to consider formalising the existing elements of its framework for safety into comprehensive national policy and strategy for safety.

To that end, in August 2019, the Standing Committee on Environmental Health (enHealth, a standing committee of the Australian Health Protection Principal Committee (AHPPC)) convened a workshop for jurisdictions to explore areas key to the development of a national strategy, including principles, scope and priority areas for action. Representatives from all jurisdictions, and representatives from enHealth and the Radiation Health Committee participated in this workshop. A subsequent workshop was held in February 2020 to further conceptualise and agree on priority areas for action to inform the objectives for a national strategy.

The resulting National Strategy is based around five key objectives:

1. **Uniformity** - to improve safety outcomes and efficiency by reducing inconsistencies in regulation and unnecessary red tape.
2. **Incident management** – to streamline and harmonise the multiple frameworks for the effective management of significant radiation incidents.
3. **Science driven policy** – to ensure there is a common evidence base for the development of codes and standards.
4. **Future proofing** – to ensure the radiation safety regulatory framework is responsive and adaptable, to take account of emerging technologies and services, and ensure potential harms are managed and benefits are realised.
5. **Life cycle management** – to develop a national approach to the safe and sustainable management of radioactive materials through all stages of their life cycle, including adequate allocation of financial and human resources for life cycle management.

This Implementation Plan – a companion document to the National Strategy for Radiation Safety - sets out specific actions which will be prioritised by governments as they work to achieve each of the five objectives outlined above.

While these actions will focus on achieving tangible outcomes, there will continue to be discussions across governments, regulators, and interested sectors to continue to shape the reform agenda for radiation safety in Australia.

These actions may be revised from time to time, and new actions may be identified and developed, echoing the objectives of the National Strategy in ensuring flexibility and adaptability, and continuing to build upon the significant work already done by jurisdictions to successfully manage the risks associated with the use of radiation across Australia.

ACTIONS TO IMPLEMENT THE NATIONAL STRATEGY FOR RADIATION SAFETY

OBJECTIVE 1 – UNIFORMITY

Improve safety outcomes and efficiency by reducing inconsistencies in regulatory requirements and unnecessary red tape.

With Australia's approach to the regulation of radiation and nuclear safety involving separate legislation in every jurisdiction, and acknowledging the different challenges facing each jurisdiction, consistency in implementation and ensuring consistency of outcomes is an enduring goal.

While Australia has successfully managed the use of radiation and nuclear technologies, supported by strong regulatory practices, change needs to occur to Australia's radiation protection framework to support a continuing but more consistent regulatory framework for ensuring radiation protection and safety for all Australians and the environment.

Implementation of regulatory consistency supports human health and environmental safety outcomes, as well as business productivity. The implementation of consistent regulatory requirements and expectations, including consistent implementation of relevant codes and standards will result in a more equitable, effective and efficient level of safety and protection of people and the environment across all jurisdictions.

Strategic actions:

- 1.1 Develop an Intergovernmental Agreement (IGA) on radiation protection standards and regulation.
- 1.2 Apply mutual recognition principles when assessing applications for authorisations and approvals
- 1.3 Develop and implement a national approach to risk identification, risk assessment, and risk management as they relate to the regulation of radiation practices.
- 1.4 Develop and implement a national competency framework for those who use radiation within radiation practices.
- 1.5 Develop guidance materials for regulators on the implementation of codes of practice to facilitate their consistent application.
- 1.6 Develop and implement a nationally agreed model for authorising radiation sources, practices and users, including consistent source life-cycle management expectations, exemption criteria and clearance levels.
- 1.7 Develop and implement nationally agreed enforcement principles, including the application of a risk-based framework to manage non-compliance.
- 1.8 Undertake a review of authorisation requirements to examine how better use can be made of existing regulatory resources, for example, through the removal of duplicative processes.

- 1.9 Revise the mechanism for ensuring consistency in the implementation of standards, codes and guides to ensure consistency in the management of radiation risks associated with facilities and activities, and consistent outcomes.
- 1.10 Develop and implement a national radiation dose register for radiation workers and other monitored persons.
- 1.11 Develop and implement a system to support the consistent review of applications for approval of package designs and special form radioactive material designs for the transport of radiation sources.
- 1.12 Investigate mechanisms to enable all jurisdictions to readily adopt international transport regulations as published by the IAEA.

OBJECTIVE 2 – LARGE-SCALE INCIDENT MANAGEMENT

Streamline and harmonise the multiple frameworks for the effective management of significant radiation incidents.

Radiation risks may transcend interjurisdictional and international borders, and despite best efforts, situations may arise that require an emergency response. Incidents may take different forms and have different scales, from a malicious act involving the use of radiation, to a car accident involving a vehicle transporting radioactive materials.

Responding to large-scale emergency incidents may require a coordinated and integrated approach across multiple frameworks, including public health, transport and environmental protection, or it may involve the provision of resources and personnel if the existing resources in a jurisdiction are temporarily overwhelmed and need to be supplemented.

Ensuring an integrated framework is in place and applied in a coordinated manner to manage large-scale radiation incidents, and ensuring the interjurisdictional and inter-agency interoperability of people and resources in emergency incident responses, will mitigate the consequences of any large-scale emergency incident. Cooperation between regulators also serves to promote and enhance safety to prevent incidents, to respond to emergencies, and to mitigate any harmful consequences.

Reviewing the multiple regulatory regimes that are currently in place in relation to radiation sources, developing a system to support integration, and investigating mechanisms to enable consistent implementation of the relevant regulatory requirements will support and enhance an efficient and efficacious radiation safety framework.

Strategic actions:

- 2.1 Develop a national framework for the management of large-scale radiation incidents, ensuring both interjurisdictional and inter-agency interoperability of people and resources.
- 2.2 Develop and implement a national register of available human and physical resources to support a response to large-scale radiation emergencies, that is maintained and committed to.
- 2.3 Develop and implement a system for tracking and ensuring the security of security enhanced sources and other sealed sources.
- 2.4 Review existing incident reporting systems, including the Australian Radiation Incident Register, and further develop and implement a national radiation incident reporting system.

OBJECTIVE 3 – SCIENCE DRIVEN POLICY

Ensure there is a common evidence base for the development of codes and standards

All regulatory systems should aspire to best practice and embed continuous improvement, especially those which deal with evolving practices or emerging technologies such as is the case in the use of radiation. Best practice and continuous improvement rely on regular review of procedures and outcomes, as well as sharing knowledge both domestically and internationally.

Strategic actions:

- 3.1 Develop a system by which Australian stakeholders can better engage in international standards development to actively participate in the making of the standards and to inform their adoption in Australia.
- 3.2 Develop a nationally agreed risk matrix to support identification, assessment and management of risk in radiation practices.
- 3.3 Ensure those matters that have been identified as broad-based risks are managed in a codified way to the greatest extent possible.
- 3.4 Continue to implement a risk-based, evidence-informed and consultative approach to a program of periodic review of codes and standards, utilising best science and regulatory experience to ensure standards remain contemporary.

OBJECTIVE 4 – FUTURE PROOFING

Ensure the radiation safety regulatory framework is responsive and adaptable, to take account of emerging technologies and services, and ensure potential harms are managed while realising the benefits.

Good regulatory practice requires an understanding of the efficacy of procedures utilising radiation sources, the protocols in place to guide and support the use of radiation sources, as well as an understanding of the magnitude of any residual risk versus the likely benefits arising from the use of radiation sources. A regulatory system that uses this understanding as its foundation has benefits to human health and environmental safety, and informs the efficient allocation of limited regulatory resources. Ensuring Australia has a strong and robust radiation safety and protection regulatory framework instils confidence in the public that Australia's radiation regulators are doing all they can to protect people and the environment from the harmful effects of particular sources of radiation.

A responsive and adaptable regulatory system requires the right legislative instruments, sound strategic directions, a strong regulatory culture, capable and competent regulators, and good governance. It is outcome-focussed, and recognises that there can be various means for regulated parties to demonstrate compliance with the relevant regulatory framework. Future proofing Australia's approach to the regulation of radiation requires changes not only to the regulatory framework, but also a cultural change in the regulatory approach to ensure regulators can keep pace with evolving technologies and nurture innovation to more fully realise the beneficial applications of radiation, while ensuring potential harms are managed.

The National Strategy lays the groundwork for a strong regulatory regime that is not only responsive to the development of technologies, products and services that rely on radiation, but also utilises contemporary technologies to enhance existing regulatory approaches.

Strategic actions:

- 4.1 Review existing radiation safety regulatory systems to identify opportunities to implement continual improvement mechanisms, including improved business architecture to streamline regulatory systems.
- 4.2 Identify opportunities to utilise modern technologies to improve the efficiency of regulatory practice.
- 4.3 Develop and implement a jurisdiction-supported information sharing system to build on and improve Australia's radiation regulatory systems.
- 4.4 Link with enHealth's workforce project to assess Australia's regulatory science workforce needs, including a gap analysis of supply and demand in the radiation regulatory workforce.
- 4.5 Undertake a self-audit against the International Atomic Energy Agency's General Safety Guides 12 (Organization, Management and Staffing of the Regulatory Body for Safety) and 13 (Functions and Processes for the Regulatory Body for Safety) to identify gaps and inform decisions about competencies and resources.

OBJECTIVE 5 – LIFE CYCLE MANAGEMENT

Develop a national approach to the safe and sustainable management of radioactive materials through all stages of their life cycle, including adequate allocation of financial and human resources for life cycle management.

The nature of radioactive materials requires a whole life cycle approach to their regulation, including the need to make appropriate provision for human and financial resources at all stages of the radiation life cycle. In 2018, the Commonwealth Department of Industry, Innovation and Science published a document 'Australian Radioactive Waste Management Framework' (the Framework), which proposed an approach to maintain intergenerational equity so that the benefits received by one generation from radiation sources do not create unnecessary obligations or unfair burdens on subsequent generations. However, the Framework proposed was only for the management of sources that have been generated, possessed or controlled by the Commonwealth Government, or a Commonwealth entity, that have come to the end of their useful life.

Developing an agreed national approach to life cycle management of radioactive materials to provide for a way of achieving some consistency across jurisdictions in managing radiation sources through all stages of their life cycle. This National Strategy will follow the lead taken by the Australian Radioactive Waste Management Framework to ensure the safe and secure management through all stages of the radiation life cycle.

Strategic actions:

- 5.1 Develop a national policy and strategy addressing arrangements for the safe and secure management and protection of end of life or disused radioactive sources, including the adequate allocation of human and financial resources where appropriate.
- 5.2 Link existing registers and systems which track and ensure the security of security enhanced sources and other sealed sources to facilitate tracking across the whole life cycle of these sources.