Australian Government
Australian Radiation Protection and Nuclear Safety Agency

arpansa

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5 November 2025

Dr Jane Canestra
Chair
Radiation Health and Safety Advisory Council

Dear Dr Canestra

Re: Residual Risks and Loss of Sealed Radioactive Sources in Australia

Thank you for your letter addressing the residual risks and loss of sealed radioactive sources in Australia and for the recommendations of Council. I appreciate Council's commitment to providing me with advice on enhancing radiation protection and nuclear safety.

I acknowledge the importance of national uniformity in radiation protection and the role of the National Directory for Radiation Protection (NDRP) in setting agreed standards across Australian jurisdictions. I also recognise that there are opportunities for improvement in the national incident reporting framework, including the need for timely and complete reporting to the Australian Radiation Incident Register (ARIR).

The recommendations highlight many areas where the challenges identified will require a multi-jurisdictional effort to resolve. ARPANSA strives to improve reporting processes by engaging with State and Territory radiation regulators to encourage their commitment and active participation. However, I note the relevant recommendations from the IAEA IRRS mission re-stated in your letter and your observations on a national sealed radioactive source register; sealed source ownership; and orphan sources.

ARPANSA has consulted with its internal subject matter experts, and I provide responses to each of Council's recommendation in **Attachment A – Response to the Recommendations of the RHSAC.**

I am committed to continued engagement with our peers to promote a nationally uniform approach.

Yours sincerely

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CEO of ARPANSA

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Attachment A

Response to the Recommendations of the RHSAC

Overall RHSAC Recommendation

"Sealed radioactive sources present potential radiation safety risks that are likely to require national uniformity. There is an opportunity for ARPANSA to lead on this issue."

Recommendation 1: Review known previous sealed source incidents to identify:

- **root causes**
- **recurring themes**
- **learnings and subsequent improvements**
- **information that was shared with regulators and industry; and**
- **whether incidents have been satisfactorily resolved or finalised.**

The responsibility for reviewing known previous sealed source incidents rests primarily with the regulators who have jurisdiction for each respective incident. Over recent years the ARIR has improved reporting numbers and introduced a web portal to help provide an easy way to input incidents to the register that also makes limited analysis easier. ARPANSA also accepts bulk submissions of data from the jurisdictions in formatted spreadsheets.

With this additional data, it is now possible to identify common occurrences such as some common categories of incidents. However, the ARIR likely under-reports incidents, and still does not contain the granular detail of data necessary to determine causation or conduct statistical analysis to determine root causes, recurring themes, learnings, and whether incidents have been satisfactorily resolved or finalised.

ARPANSA continues to support the sharing of learnings from incidents between regulators through the regulatory knowledge exchanges sessions at Radiation Health Committee (RHC) meetings. These shared learnings help inform relevant national codes and policies that guide regulation. ARPANSA remains firmly committed to encouraging further reviews of sealed source incidents, through targeted discussions at RHC.

Recommendation 2: Review current reporting arrangements for timeliness and completeness, or entry categorisation.

The reporting arrangements for ARIR are outlined in the National Directory for Radiation Protection 2nd Edition (NDRP2). While the NDRP2 is a national agreement it remains legally non-binding and compliance by jurisdictional regulators is voluntary. While the nominal timeline for providing data to ARIR is six months, the completion of data submission, including the level of incident details and categorisation, is ultimately dependent on jurisdictional resources and processes, including legal implications which may lead to extended delays in reporting.

ARPANSA will continue to encourage early reporting, noting recent significant lost source incidents which represent an opportunity to improve coordination between jurisdictions. ARPANSA will also consider opportunities for improving definitions on the categorisation of incidents (such as in a proposed National Glossary of Terms) and establishing national data standards for incident reporting in the Radiation Protection Series. This work would then need to be considered with all priorities within the RHC forward program of work.

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Recommendation 3: Identify any residual safety risk from missing sealed radioactive sources currently recorded in the ARIR database.

ARPANSA notes that the responsibility for identifying any residual risk from missing sealed radioactive source incidents rests again primarily with the regulators who have jurisdiction for each respective incident. Where requested, ARPANSA can provide additional resources to investigate material out of regulatory control. However, the ARIR Annual Report can only make limited findings, based on the data submitted by jurisdictions, noting that incident reports of lost sources are rare.

Recommendation 4: Review the format of the ARIR Annual Report to establish whether the information identifies trends and opportunities for improvement with regulators, owners and operators to seek to close the quality assurance loop.

ARPANSA recently streamlined the ARIR Annual Report format and will continue to invite feedback from jurisdictions and other stakeholders. The ARIR Annual Report attempts to identify trends and opportunities for improvement within the constraints of data submitted to the ARIR. Noting that whilst incomplete and under reporting of incidents limits statistical analysis, it is still possible to observe useful lessons from a small number of incidents, if the data received by ARPANSA is of sufficient scope, depth, and quality.

ARPANSA is committed to sharing any identified trends and opportunities for improvement with regulators, owners and operators, based on the findings of the streamlined ARIR Annual Report format, which will include 'deep dives' into key issues highlighted as part of the new reporting format in coming years.

Recommendation 5: Review comparable radiation incident reporting databases from other jurisdictions, and other Australian and international safety industries, and identify options for improving the ARIR database.

ARPANSA has previously compared ARIR against international reporting (including IAEA, US and UK) systems and state-based reporting (such as NSW eHealth CDC Incident Management System ims+). These revealed some similarities and some differences, with some being significantly more comprehensive. Options considered include data sharing to ensure data captured in existing systems could potentially be imported into ARIR to reduce the data burden on end users. This review considered potential enhancements that could be made in the radiotherapy space as a proof of concept and then rolled out to other modalities. Radiotherapy was an area of comparatively higher risk than other areas, and one with strong support from end-users for sharing more near-miss and incident data. Whilst it is possible to develop the ARIR further, it would need multi-jurisdictional commitment and support to design and develop an improved register, and to support it moving forwards. This would include significant and ongoing financial investment.

Recommendations 6: Explore options for a National Register of sealed sources, possibly including capturing source identification when import permits are issued.

AND

Recommendations 7: Consider enhancement of safety and security of sources, possibly through the adoption of a tracking system.

ARPANSA acknowledges past national agreements, such as the April 2007 the Council of Australian Governments (COAG) agreed to nationally uniform arrangements to regulate the secure storage, possession, use and transport of certain radiological materials. It also acknowledges that the RHC in November 2020 noted the need for projects such as the re-establishment of a National Sealed Source Register (NSSR), as recommended by the 2018 IAEA IRRS Mission.

ARPANSA notes challenges with implementation due to a range of issues, including financial and resourcing constraints. However, we recognise the current domestic and global security environment presents a need to reassess and identify the gaps existing and develop strategies to enhance the security of radioactive sources and ensure we are meeting both national and international security expectations.

ARPANSA will explore options for sharing information with jurisdictional regulators on sealed sources, based on source data provided at the point when import permits are issued under Regulation 4R of the Customs (Prohibited Imports) Regulations 1956 for the import of radioactive substances for medical and non-medical use.

ARPANSA will also request the RHC to specifically consider exploring and adopting a tracking system for security enhanced sources.

Recommendation 8: Consider options to ensure responsible persons comply with regulatory requirements for sealed source management, including periodic and compliance inspections, and the implementation of remedial actions.

ARPANSA notes that the regulatory requirements for sealed source management are already covered in nationally agreed Radiation Protection Series (RPS) publications of codes and standards.

ARPANSA will encourage jurisdictions to share experiences with remedial actions and options to improve regulatory compliance, noting that it is the responsibility of the relevant radiation regulators to conduct inspections or audits and review compliance reporting, to ensure responsible persons comply with regulatory requirements.

ARPANSA notes the 2018 IAEA IRRS Report which recommended that Australian jurisdictions could consider establishing a unified national approach to rank radiation sources and facilities according to their inherent risks, as a way to proactively prioritise regulatory activities. ARPANSA will continue to encourage the RHC to consider a national approach to radiation risk assessments through ongoing knowledge sharing of existing jurisdictional risk-based approaches to regulatory priorities and activities.

ARPANSA has updated its relevant regulatory policies and manuals in the Commonwealth jurisdiction, regarding inspections and remedial actions, to ensure responsible persons comply with regulatory requirements.

- Regulatory Activities Policy (ARPANSA-POL-002), which provides the over-arching framework for efficient and effective regulatory activities to achieve the object of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) to protect the health and safety of people, and to protect the environment, from the harmful effects of radiation.

- Inspection Manual (ARPANSA-GDE-1119) which elaborates on the Regulatory Activities Policy as relevant to inspections. The policy is aligned with the IAEA General Safety Requirements (GSR Part 1 Rev 1) Governmental, Legal and Regulatory Framework for Safety. Much of the practical guidance in the Inspection Manual is taken from IAEA publications including Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards GSR Part 3 and General Safety Guide GSG-13 Functions and Processes of the Regulatory Body for Safety, 2018. The Inspection Manual applies a graded approach to inspection and inspection frequency is normally based on regulatory priority. Inspections are performed following Facility Licence (3-year) and Source Licence (6-year) inspection schedules.

ARPANSA's methodology for ranking regulatory priority for facility licences is based on risk, taking into account controls in place, while the methodology for determining regulatory priority for sources is based on the inherent hazard of the source which governs the frequency and the intensity of the inspection.

Recommendation 9: Develop guidance for the management of "orphan" radioactive sources in Australia.

ARPANSA will propose to the Radiation Health Committee that it considers developing guidance for the management of "orphan" radioactive sources in Australia as part of its 2026 Workplan.

Australian guidance on the management of "orphan" sources or material out of regulatory control (MORC) could be informed by the following IAEA publications.

Nuclear Security Series No.15, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control (2011)

This publication presents recommendations for the nuclear security of nuclear and other radioactive material that is out of regulatory control. It is based on national experience and practices and guidance publications in the field of security as well as the nuclear security related international instruments. The recommendations include guidance for States with regard to the nuclear security of nuclear and other radioactive material that has been reported as being out of regulatory control as well as of material that is lost, missing or stolen but has not been reported as such, or has been otherwise discovered. In addition, these recommendations adhere to the detection and assessment of alarms and alerts and to a graded response to criminal or unauthorized acts with nuclear security implications.

Note: This guide has been identified by the IAEA as in need of updating.

Nuclear Security Series No. 47-T, Detection in a State's Interior of Nuclear and Other Radioactive Material out of Regulatory Control (2024)

This publication provides guidance on planning, implementing and evaluating systems and measures in a State in order to detect nuclear and other radioactive material out of regulatory control in the State's interior by means of instrument alarms and information alerts. The guidance covers the planning of detection operations, equipment deployment and human resource development.

Specific Safety Guide No.17, Specific Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries (2012)

This Safety Guide is concerned with orphan sources and other radioactive material that may enter the metal recycling supply chain. It applies to all operations in the handling of scrap metal for recycling and the

subsequent processing of this material. However, in view of the wide range in size of these operations, this Safety Guide provides recommendations on how to apply a graded approach to the control of orphan sources and other radioactive material, on the basis of the size of the individual metal recycling and production facility and on the radioactive material that it might reasonably be expected to encounter.

Note: This guide is currently under review by the IAEA Radiation Safety Standards Committee (RASSC)

Specific Safety Guide No.19, National Strategy for Regaining Control Over Orphan Sources and Improving Control Over Vulnerable Sources (2011)

This Safety Guide describes actions that should be taken by governments and governmental bodies to establish a national strategy for regaining control over orphan sources and improving control over vulnerable sources. It recommends the application of a graded approach in accordance with the category of the source.

Note: This guide has been identified by the IAEA as in need of updating.