



Australian Government
**Australian Radiation Protection
and Nuclear Safety Agency**



Quarterly Report
of the
Chief Executive Officer of ARPANSA

January to March 2020



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Acknowledgement of Country

ARPANSA respectfully 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.

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Table of contents

Table of contents	1
Letter of transmittal.....	1
The operations of the CEO and ARPANSA.....	2
Provide high quality advice to government and the community on health, safety and environmental risks from radiation	2
Provide emergency preparedness and response systems for a radiological or nuclear incident	4
Promote patient safety in radiotherapy and diagnostic radiology	4
Ensure risk-informed and effective regulation	5
International engagement	7
Details of directions given by the Minister	8
Details of directions given by the CEO.....	8
Details of improvement notices given by inspectors.....	8
Details of any breach of licence conditions by a licensee	8
Facilities licensed under Part 5 of the ARPANS Act	8
The operations of the Council and Committees.....	8
Radiation Health and Safety Advisory Council.....	8
Radiation Health Committee.....	9
Nuclear Safety Committee	9

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Letter of transmittal

13 May 2020

Senator the Hon Richard Colbeck
Minister for Aged Care and Senior Australians
Minister for Youth and Sport
Senate
Parliament House
Canberra ACT 2600

Dear Minister

The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer (CEO) of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- the operations during the quarter of the CEO, ARPANSA, the Radiation Health and Safety Advisory Council (the Council), the Nuclear Safety Committee (the NSC) and the Radiation Health Committee
- details of directions given by the Minister to the CEO under section 16 of the Act
- details of directions given by the CEO under section 41 of the Act
- details of improvement notices given by inspectors under section 80A of the Act
- details of any breach of licence conditions by a licensee, of which the CEO is aware
- details of all reports received by the CEO from the Council and the NSC under Part 4, paragraphs 20(f) or 26(1)(d) of the Act, and
- a list of all facilities licensed under Part 5 of the Act.

I am pleased to provide you with a report, meeting the requirements of the Act, covering the period 1 January to 31 March 2020.

Please note that subsection 60(6) of the Act requires you to cause a copy of the report to be laid before each House of the Parliament within 15 sitting days of the day on which this report was given to you.

Yours sincerely



Carl-Magnus Larsson
CEO of ARPANSA

The operations of the CEO and ARPANSA

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is 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, through understanding risks, best practice regulation, research, policy, services, partnerships and engaging with the community.

ARPANSA sits within the Department of Health portfolio and has a single outcome, as set out in the 2019-20 Portfolio Budget Statements (PBS):

Protection of people and the environment through radiation protection and nuclear safety research, policy, advice, codes, standards, services and regulation.

The Radiation Protection and Nuclear Safety Program, contained within the 2019-20 PBS, describes four performance criteria, against which ARPANSA seeks to achieve its outcome. These criteria are:

- Provide high quality advice to government and the community on health, safety and environmental risks from radiation.
- Provide emergency preparedness and response systems for a radiological or nuclear incident.
- Promote patient safety in radiotherapy and diagnostic radiology.
- Ensure risk-informed and effective regulation.

The report on the operations of the CEO and ARPANSA focuses on these criteria.

COVID-19 Pandemic

Towards the end of the quarter ARPANSA suspended all non-essential services while transitioning to largely remote working arrangements. A number of services subsequently resumed after additional measures were put in place. More information on the impact of the COVID-19 restrictions on ARPANSA's activities will be included in the next quarter's report.

Provide high quality advice to government and the community on health, safety and environmental risks from radiation

Occupational exposure to radiation

The Australian National Radiation Dose Register (ANRDR) holds dose records for around 46 000 workers. This includes full coverage of workers from all state and territory-licensed uranium mining and milling operations, and partial coverage of workers from Commonwealth licence holders, state and territory regulatory bodies, the mineral sands mining and processing industry, as well as the medical and veterinary sectors. The aim of the ANRDR is to cover all occupationally exposed workers in Australia, and work to ensure that this can be achieved across all jurisdictions is in progress.

The ANRDR commenced data-cleansing work during the quarter to remove duplicated records for individuals and ensure the system can fully utilise the benefits of the Employer Interface Improvement project which was completed in 2019.

The ANRDR Advisory Board met for the first time in March 2020, following the Radiation Health Committee's approval of its establishment. The Advisory Board is coordinated by ARPANSA and consists of members from most jurisdictional regulators (including an ARPANSA regulatory representative). The Board's primary purpose is to be a place for jurisdictional radiation regulators to represent their views with regard to ANRDR matters, and to provide advice and guidance to ARPANSA on the approach to development and national expansion of the ANRDR.

ARPANSA scientist appointed to peak international body on non-ionising radiation

In January 2020, ARPANSA scientist Dr Ken Karipidis was appointed to the International Commission on Non-Ionizing Radiation Protection (ICNIRP) for the term of 2020 to 2024. ICNIRP is a body of independent scientific experts who provide information and advice on potential adverse effects of non-ionising radiation. The duties of ICNIRP include developing recommendations and guidelines and cultivating cooperation with other organisations in the field of non-ionising radiation protection. Many countries, including Australia (through ARPANSA), formulate their national standards for non-ionising radiation protection based on guidelines and advice from ICNIRP.

In March, ICNIRP released a revision of its guidelines for radiofrequency radiation protection. ARPANSA's standard for radio waves: Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (2002), available at <https://www.arpansa.gov.au/regulation-and-licensing/regulatory-publications/radiation-protection-series/codes-and-standards/rps3> will be updated during 2020 to ensure alignment with the new ICNIRP guidelines.

Funding for an Enhanced EME Program

ARPANSA began planning the implementation of an enhanced EME program with additional resourcing to be obtained from July 2020. The Australian Government announced this four-year program to provide clear, reliable and reputable information accessible to all Australians, and included funding for ARPANSA to deliver evidence-based scientific advice with a clearly informed picture of the problem and associated risks and uncertainty. The ARPANSA components of the enhanced EME program include new forms of engagement into international forums (such as the WHO and ICNIRP), undertaking or partnering on new EME research, undertaking studies to assess EME exposure in the Australian community, offering EME equipment calibration services and providing expert advice for Australia on EME and health.

ARPANSA's UV network detectors in the Antarctic

ARPANSA staff travelled to Macquarie Island in March to install the next generation of ultra-violet radiation (UV) sensors that are being rolled out across the UV network, and implement new measures to protect sensors from subzero temperatures. ARPANSA maintains a network of detectors in Australia and Antarctic territories for monitoring of UV radiation, including four stations across Antarctica. The UV data collected through ARPANSA's monitoring network is available in a real-time UV index chart on the ARPANSA website (<https://www.arpansa.gov.au/our-services/monitoring/ultraviolet-radiation-monitoring/ultraviolet-radiation-index>). The trip was part of a program led by the Australian Antarctic Division to conduct scientific research and support the conservation of the continent's unique environment.

Provide emergency preparedness and response systems for a radiological or nuclear incident

Comprehensive Nuclear-Test-Ban Treaty (CTBT) monitoring stations

In conjunction with the above trip to Macquarie Island to maintain ARPANSA's UV network, ARPANSA staff also carried out annual maintenance on part of its radionuclide monitoring system. This work forms part of Australia's involvement in the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which bans nuclear explosions and testing and includes a monitoring network to detect nuclear activity. The CTBT international monitoring system aims to ensure that no nuclear explosion goes undetected. ARPANSA is responsible for a total of nine radionuclide monitoring stations, including one in Antarctica and one on Macquarie Island.

Occupational exposure advice for emergency workers

ARPANSA published specific advice on its website in March in the form of a fact sheet (<https://www.arpansa.gov.au/understanding-radiation/sources-radiation/occupational-exposure/occupational-exposure-emergency>) for emergency workers and helpers in the event of a nuclear or radiological emergency. This fact sheet provides an overview to protect emergency workers and helpers from occupational exposure to ionising radiation during an emergency. This fact sheet is expected to form the basis of training throughout Australia for occupational protection during radiation response. This is part of the implementation of the Emergency Exposure Guide (Radiation Protection Series G-3), and fulfils recommendations received from recent international peer reviews.

Promote patient safety in radiotherapy and diagnostic radiology

Medical imaging

ARPANSA has finalised the initial release of its Occupational Radiation Exposure (ORE) on-line training package for medical facilities. The ORE package provides tailored radiation safety training modules suitable for a range of staff, including administrative staff, receptionists, cleaners, through to nurses, radiographers, physicians and other clinicians. The package aims to provide consistent messaging and a baseline level of understanding that is accessible to any medical facility using ionising radiation anywhere in Australia. This will support facilities that may have difficulty developing and resourcing their radiation safety training program. The training package will be available as an on-line module and also as elements that can be downloaded and included in an electronic learning management system or incorporated into a lecture presentation. Arrangements for hosting the package on the ARPANSA website are being finalised and a formal release is being planned.

Primary Standards Dosimetry Laboratory

ARPANSA's Primary Standards Dosimetry Laboratory provided calibrations for five hospital radiotherapy departments. Preparations continued for key international comparisons that ARPANSA performs every 10 years to establish the equivalence of radiation measurements in Australia with the rest of the world. While ARPANSA conducts regular comparisons for other purposes, the key comparisons are peer-reviewed and result in the official 'Degrees of Equivalence' which are made available publicly by the International Bureau of Weights and Measures. Agreement with other countries' measurements is strong evidence that radiation measurements in Australia are accurate and equivalent to those overseas. This is particularly

important for radiotherapy, for example, where prescribed radiation doses for cancer treatments may come from advice published overseas.

The Australian Clinical Dosimetry Service

The Australian Clinical Dosimetry Service (ACDS) provides all radiation oncology service providers in Australia with a source of independent checks through different types of audits of equipment and patient doses. One audit this quarter at a radiotherapy facility found that doses of radiation to patients given as cancer treatment were higher than planned due to an error at a facility. ARPANSA staff and the facility's staff were able to identify and correct the error while onsite for the audit. The facility notified the clinicians who contacted affected patients. The facility also notified the jurisdictional regulator. Such systemic incidents are infrequent, but may have significant impact on patients, carers and staff. As such, this outcome is a great example of the purpose and value of ACDS audits which, at a small cost, ensure the safety of radiotherapy treatment in Australia.

Ensure risk-informed and effective regulation

Significant regulatory activities

During the quarter, ARPANSA issued a number of regulatory approvals. Regulatory approvals are required prior to commencing certain activities, which can include new and/or amendment of licences, or changes with significant safety implications, or the construction of items important for safety. In this quarter regulatory approvals included:

- ARPANSA removed a condition from the licence of the ANSTO Nuclear Medicine (ANM) facility, related to limited production of Mo-99. The condition had achieved its objective of ensuring that measures were in place to improve safety in a number of areas. A new licence condition was imposed which requires ANSTO to notify ARPANSA at key points prior to the staged increase in production, and provide justifications (including consideration of safety factors and risk mitigation measures) as well as relevant information. This will give additional assurance that key controls are in place and will allow for increased monitoring by ARPANSA.
- ARPANSA approved the full operation of a fourth beamline on ANSTO's SIRIUS accelerator (three beamlines were previously approved to move to full operations as reported in 2019). This will enable ANSTO to conduct research using the SIRIUS Instrument as intended. Two beamlines remain approved for hot commissioning only while testing is ongoing.
- Approval was granted to ANSTO for the construction of the active ventilation system for the SyMo Facility. The facility, which is on a construction licence, will use the ANSTO Synroc technology for the immobilisation of intermediate level liquid waste arising from Mo-99 production processes.

Inspections

ARPANSA conducted six scheduled and three additional inspections, and six site visits, during the quarter. ARPANSA undertakes a program of scheduled inspections of licence holders to monitor compliance with the Act and the Australian Radiation Protection and Nuclear Safety Regulations 2018 (ARPANS Regulations).

The scope and frequency of inspections are determined from an assessment of the risk presented from the controlled activity and a range of factors including licence holder safety performance.

This quarter's inspections identified two potential non-compliances. Fifteen areas for improvement were also identified. Potential non-compliances indicate an area where the licence holder may not have complied with legislation or a condition of licence, such as adherence to a code – once confirmed these are considered a breach as described in section 'Details of any breach of licence conditions by a licensee' of this report. Areas for improvement indicate where licence holder safety performance could be improved, such as to meet international best practice.

Inspections play an important part in ARPANSA's compliance and performance monitoring program. A well implemented, rigorous inspection program supplemented by monitoring and performance reviews provides assurances that licence holders are operating safely. The inspection reports can be found on ARPANSA's website at www.arpansa.gov.au/regulation/inspections/reports.

Standards development

The amended Code for Radiation Protection in Planned Exposure Situations, RPS C-1, was published on ARPANSA's website on 25 February 2020. The amendment includes the specification of dose limits for the 16-18 years' age group, which was a recommendation of the IAEA's Integrated Regulatory Review Service Mission conducted in November 2018.

Stakeholder engagement

The public consultation period for the revised Guide for Classification of Radioactive Waste (RPS G-4) ended on 14 February with a number of changes made to incorporate feedback provided. The guide has been revised to be fully consistent with the current international standard (IAEA General Safety Guide-1). The revised guide was presented at the Radiation Health Committee (RHC) meeting on 4-5 March 2020 and approved for publication on ARPANSA's website subject to minor changes to scope and the revised foreword. The guide sets out a general scheme for classification of radioactive waste for the safe management of radioactive waste.

A working group to develop self-inspection tools was initiated in March 2020. The working group is developing a series of 'checklists' that can be used by any workplace to assess their compliance against radiation safety codes, standards and guides. This helps a workplace to assess their level of safety, and identify areas for improvement and document where there are deviations from recommended practices. This process compliments regulatory inspections by providing licence holders with a tool to confirm that some of the key requirements are in place and detect potential non-compliances. A baggage x-ray scanner checklist has been completed as a successful proof of concept, and so far nine licence holders have signed up to work on a laser safety checklist. The project will then look to establish further checklists for a variety of applications to help promote safe practices across Australia.

Radioactive material import and export permits

The import and export of radioactive material to and from Australia requires permission under Regulation 4R of the Customs (Prohibited Imports) Regulations 1956 and Regulation 9AD the Customs (Prohibited Exports) Regulations 1958. Under these regulations, the Minister for Health has authorised ARPANSA officers to issue import and export permits. Permits ensure that radioactive material entering and exiting

the country is subject to appropriate regulatory control. This includes a requirement that the end user is authorised to deal with the material, and that it is subject to appropriate safety and security provisions en-route and at its final destination. This material is used for a wide range of medical, industrial and scientific purposes.

Permits issued this quarter:

<i>Type of Permits</i>	<i>Urgent (single shipment)</i>	<i>Standard (single shipment)</i>	<i>12 Month</i>
<i>Import of Non-Medical radioisotope</i>	72	48	3
<i>Import of Medical radioisotope</i>	-	131	9
<i>Export of high activity source</i>	-	13	-

Transport of radioactive material

ARPANSA approves certain plans and packages for the transport of significant quantities of radioactive material by licence holders.

ARPANSA endorsed four transport security plans this quarter. Under the Code of Practice for the Security of Radioactive Sources (RPS 11, 2019), security-enhanced sources are assessed to ensure the security considerations, including the transport arrangements and route, are suitable for the shipment.

International engagement

ARPANSA's international engagement provides the agency with the means of influencing the international radiation protection and nuclear safety and security framework and tracking international developments, in order to help Australia's regulatory framework and standards align with international best practice.

In February, the CEO of ARPANSA participated in a Convention on Nuclear Safety (CNS) Officers' Meeting held in Austria. The CNS aims to promote high standards of nuclear reactor safety. Countries submit national reports every three years for peer review, and the CNS holds Review Meetings to scrutinise peer results. The CEO attended this planning meeting as the Vice-President of the next CNS Review Meeting. Participation the CNS allows Australia to benchmark its nuclear safety policies and practices against other countries and contribute to the safe use of nuclear technology globally.

ARPANSA's CEO was Deputy Team Leader for an International Atomic Energy Agency (IAEA) mission to Japan in January, to follow-up progress implementing recommendations since a 2016 IAEA peer review of the Japanese system for nuclear safety and radiation protection. Similar to CNS activities, Australia's support of such IAEA peer reviews is a key opportunity to promote safety in the region and globally, and learn from the experience of other regulators.

Of further note, ARPANSA was engaged by New Zealand's Centre for Radiation Science (NCRS) in January to independently assess them against international best practice in radiation safety.

An ARPANSA officer attended an International Conference on Nuclear Security (ICONS 2020) as part of the Australian delegation which focussed on strengthening sustainability measures for nuclear security, such as cyber security threats for both nuclear and radiological materials.

Towards the end of the quarter, some international travel was cancelled or postponed due to the impacts of COVID-19.

Details of directions given by the Minister

No directions were given by the Minister under section 16 of the Act.

Details of directions given by the CEO

No directions were given by the CEO under section 41 of the Act.

Details of improvement notices given by inspectors

No improvement notices were issued by ARPANSA under section 80A of the Act.

Details of any breach of licence conditions by a licensee

There were two breaches determined in this quarter and were considered to have minor or no significant safety implications. The breaches were for failing to comply with licence conditions, including those in the Australian Radiation Protection and Nuclear Safety Regulations 2018. These breaches were:

- One breach was for failing to seek prior approval for the transfer of a radiation source as required under section 65(2) of the Regulations. The UV source was transferred to a state jurisdiction licence holder without the required prior approval. This breach was self-reported.
- One breach was for failing to seek approval to dispose of a source as required under section 65(1) of the Regulations. The CEO was not notified within 7 days of disposal of the x-ray equipment. This breach was self-reported.

There were no breaches with significant safety implications this quarter.

Facilities licensed under Part 5 of the ARPANS Act

No facility licences were issued in the period.

The operations of the Council and Committees

Radiation Health and Safety Advisory Council

The Radiation Health and Safety Advisory Council (RHSAC) did not meet during the quarter. It was scheduled to meet on 17-18 March however this was cancelled due to the implementation of COVID-19 restrictions.

The terms of appointment for several member positions expired at 31 March 2020 and it is anticipated that new members will soon be appointed following a process seeking nominations that commenced in 2019.

The minutes of past meetings are on ARPANSA's website at www.arpansa.gov.au/rhsac. The next meeting is scheduled for 27-28 July 2020 in Melbourne.

Reports to the CEO from the RHSAC under paragraph 20(f) of the Act

The RHSAC did not provide any reports to the CEO during this quarter.

Radiation Health Committee

The Radiation Health Committee (RHC) met on 4-5 March 2020 in Sydney. The committee discussed various issues related to national uniformity and RHC projects.

The RHC agreed to continue engagement with the Australian Dental Association and seek their views on issues related to dental radiography. The updated RHC Statement on Safe Handling of Deceased Persons Recently Treated with Radioactive Material was approved by the Committee. This Statement sets out the information to assist in achieving the levels of protection specified in the Code for Radiation Protection in Medical Exposure (2019), RPS C-5, which contains the requirements that govern radiation protection in radiotherapy and nuclear medicine.

The RHC approved a Statement on the Ethical Review for Multi-centre Trials related to application of the 'Code of Practice for the Exposure of Humans to Ionising Radiation for Research Purposes'. A revised Guide for Classification of Radioactive Waste (RPS G-4) incorporating stakeholders' comments, and stakeholder analysis for the national source register were also approved. Further information can be found in the meeting minutes on ARPANSA's website at www.arpansa.gov.au/rhc.

The next RHC meeting is scheduled to take place in Sydney on 22 and 23 July 2020.

Nuclear Safety Committee

The Nuclear Safety Committee (NSC) met on 6 March 2020. A range of topics mostly associated with safety of ANSTO facilities was discussed.

The NSC was informed of a number of safety improvements implemented at ANSTO in response to regulatory actions arising from a number of safety incidents and accidents. ANSTO attended a portion of the meeting to provide information on a safety culture perception survey that was undertaken at the request of ARPANSA. The NSC noted the positive nature of the survey and commented on the importance of looking at the full distribution of responses that is useful to identify and drive cultural improvements.

The minutes of NSC meetings are available on the ARPANSA website at www.arpansa.gov.au/nsw. The next NSC meeting is scheduled to take place in Sydney on 26 June 2020.

Reports to the CEO from the NSC under paragraph 26(1)(d) of the Act

The NSC did not provide any reports to the CEO during this quarter.