Australian Government

Australian Radiation Protection and Nuclear Safety Agency

arpansa

Quarterly Report

of the

Chief Executive Officer of ARPANSA

April to June 2018

Australian Government

Australian Radiation Protection and Nuclear Safety Agency

arpansa

Quarterly Report

of the

Chief Executive Officer of ARPANSA

April to June 2018

ARPANSA
619 Lower Plenty Road
Yallambie VIC 3085
email: info@arpansa.gov.au

Further information about this publication

If you would like to know more about the content of this publication please contact ARPANSA on 1800 022 333 or **info@arpansa.gov.au**. Further information can be found on the ARPANSA website at **www.arpansa.gov.au**.

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.

Printed by:

CanPrint Communications Pty Ltd
16 Nyrang Street
Fyshwick ACT 2609

Table of contents

This page has been left blank intentionally.

Letter of transmittal

September 2018

Senator the Hon Bridget McKenzie
Minister for Regional Services, Sport, Local Government and Decentralisation
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 April to 30 June 2018.

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

Dr Carl-Magnus Larsson
CEO of ARPANSA

The operations of the CEO and ARPANSA

ARPANSA sits within the Department of Health portfolio.

ARPANSA has a single outcome, as set out in the *2017–18 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 2017–18 PBS, describes four performance objectives against which ARPANSA seeks to achieve its outcome. These criteria are:

- protecting the public, workers and the environment from radiation exposure
- promoting radiological and nuclear safety and security, and emergency preparedness
- promoting the safe and effective use of ionising radiation in medicine
- ensuring risk-informed and efficient regulation.

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

Protecting the public, workers and the environment from radiation exposure

Recent advice issued

In June, ARPANSA provided advice to the Northern Territory Chief Health Officer on the effect of mine-related radiation exposure for the Gunbalanya-Kakadu Cancer Cluster Investigation.

Australian National Radiation Dose Register

ARPANSA maintains the Australian National Radiation Dose Register (ANRDR) which stores, maintains and reviews radiological dose histories for occupationally exposed workers in Australia.

The ANRDR holds dose history records for more than 44 000 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, and the mineral sands mining and processing industry.

ARPANSA is working to expand the ANRDR, with a goal to ultimately include all occupationally exposed workers in Australia. Project work is continuing on the ANRDR to include regulator and worker online portals as well as make general improvements to the ANRDR. This work is aimed to promote ANRDR implementation across all Australian jurisdictions.

The ANRDR team continued to work with Commonwealth licence holders for whom the submission of dose records to the ANRDR is a mandatory requirement. All relevant licence holder organisations have plans in place to submit dose records and are all committed to submitting their dose records within reasonable timeframes.

Monitor and mitigate population exposures to electric and magnetic fields and electromagnetic radiation

The Electromagnetic Energy Reference Group (EMERG) met on 8 May 2018 for a session focusing on the emerging 5G technology. EMERG meets twice annually to receive input from the community and other stakeholders and discuss and advise on issues relating to electromagnetic energy and health (https://www.arpansa.gov.au/about-us/what-we-do/national-collaboration/emerg).

Solar ultraviolet radiation and sun protection

ARPANSA measures solar ultraviolet radiation (UVR) at 12 sites around Australia and four sites in the Australian Antarctic territories. This includes an additional detector recently installed at a new site on the Gold Coast in Queensland. During this quarter, ARPANSA continued the replacement of measurement station infrastructure around Australia. Currently, all but one of the mainland stations have undergone infrastructure replacement. The UVR index data generated by the network is used to raise awareness in Australia of the levels of UVR exposure in conjunction with messaging on the risks associated with excessive sun exposure.

Standards development

An ARPANSA staff member is chairing Standards Australia committee TE-007: Human exposure to electromagnetic fields revision of AS/NZS 2772.2:2016 (Radiofrequency fields Principles and methods of measurement and computation - 3 kHz to 300 GHz).

During the quarter, draft amendments, mostly aimed at harmonisation with the international standard IEC 62232:2017 (Determination of RF field strength, power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure), were released for public comment.

ARPANSA has been part of the drafting group for the revision of the 1998 standard for ionising radiation safety in laboratories (AS 2243.4) through Standards Australia. After significant consultation, the document has been formally accepted by both Standards Australia and Standards New Zealand – it is now a joint standard. The standard was approved for publication on 21 June 2018.

Promoting radiological and nuclear safety and security, and emergency preparedness

Security of nuclear facilities, radioactive material and associated facilities

ARPANSA attended the Chemical, Biological, Radiological and Nuclear (CBRN) Security Sub-Committee of the Australian and New Zealand Counter-Terrorism Committee. ARPANSA contributions focused on providing updates on security background-checking framework initiatives and border safety and security issues.

ARPANSA attended the Australian Nuclear Science and Technology Organisation (ANSTO) Spent Fuel Shipment project meetings in preparation of the first shipment of spent nuclear fuel from the Open Pool Australian Lightwater reactor (OPAL) to France for reprocessing. Logistics, safety, security and emergency response were discussed in accordance with existing national arrangements and international best practice.

ARPANSA engaged with Auscheck in order to initiate discussions to progress the National Background Checking Framework, a requirement to fully implement the ARPANSA *Code of Practice on the Security of*

Radioactive Sources (2007). The discussions covered enabling legislative arrangements, existing background checking systems, harmonisation of disqualification criteria and future steps with ARPANSA and the Radiation Health Committee on this project.

International monitoring system

As part of Australia's ongoing commitment to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), ARPANSA operates and maintains the Australian CTBT Radionuclide Laboratory in Melbourne and radionuclide air particulate monitoring stations that are part of the CTBT International Monitoring System. Stations are located in Melbourne, Perth, Townsville, Darwin, the Cocos Islands, Macquarie Island, and Mawson Base (Antarctica). Two noble gas monitoring facilities are co-located with the air particulate monitoring stations in Melbourne and Darwin. Data is provided to the CTBT Organisation on a daily basis.

The Australian CTBT Radionuclide Laboratory was in service for the entire quarter. Nine samples were analysed during this period.

Emergency preparedness

ARPANSA attended the Lucas Heights Sub Plan Review Working Group on 18 June 2018, which consists of a range of emergency services organisations and regulators and is hosted by the Sutherland Shire Council, and ANSTO as the operator of the nuclear facilities at Lucas Heights. The working group discussed progress of the revision of the off-site radiological emergency response planning arrangements for Lucas Heights. ARPANSA participated as an observer and provided guidance against national and international best practice.

An agency-wide telephone exercise testing the activation of the ARPANSA Incident Management Plan was undertaken after-hours on 20 June 2018. Similar exercises will be conducted quarterly.

ARPANSA is establishing the Australian Radiation Monitoring Network, a network of radiation detectors to monitor Australian ports during visits from nuclear-powered warships, and other facilities such as the nuclear facilities at Lucas Heights. It may have applications for a future National Radioactive Waste Management Facility for monitoring and providing information on radiation levels to the community. Purchase of detectors was undertaken during the quarter, with installation expected by the end of 2018. Real-time data will be made available to the public on a continuous basis on the ARPANSA website.

Promoting the safe and effective use of ionising radiation in medicine

Radiotherapy

As a part of the ARPANSA Radiotherapy section's regular calibration services for radiotherapy providers and industry users of radiation, ARPANSA calibrated six therapy dosimeters and one neutron monitor for the quarter. In support of these services and the measurement of doses used in radiotherapy, ARPANSA has been developing computer models of the response of common and new radiotherapy detectors. The section has engaged with manufacturers and obtained the detailed specification required for modelling these detector chambers. The work is being performed as one of six selected laboratories in a world-wide collaboration to support the International Atomic Energy Agency (IAEA) in updating its international protocols for dosimetry. The resulting protocols will be adopted by all providers within Australia to ensure accurate patient dose delivery.

Australian Clinical Dosimetry Service

The Australian Clinical Dosimetry Service (ACDS) provides radiation oncology service providers with a source of independent checks for equipment and patient doses. This enables an integrated national approach to promoting safety and quality in radiotherapy, which is expected to lead to further improvements in radiotherapy treatment outcomes. The ACDS transitioned to a full cost recovery user-pays service on 1 January 2017 and is in the process of negotiating service level agreements with radiotherapy facilities. Ninety-eight percent of Australian facilities have subscribed to the user-pays model of the ACDS and the final two per cent are finalising their service agreements. During the quarter, the ACDS completed 34 audits of radiotherapy equipment. In June, the ACDS performed the first audits on a CyberKnife Robotic Radiosurgery System, a robot-mounted linear accelerator.

Medical Imaging

ARPANSA's National Diagnostic Reference Level Service (NDRLS) collects data on patient dose metrics in diagnostic imaging from surveys and uses it to calculate Australian Diagnostic Reference Levels (DRLs) for common multi-detector computed tomography (MDCT) protocols. The size of the data sample collected impacts confidence in the DRLs that ARPANSA sets. A total of 419 survey reports were submitted in the quarter, compared with 331 in the same period last year. Twelve new registrants signed up to participate.

The revised adult MDCT DRLs recommended by the MDCT DRL Liaison Panel were discussed with the advisory committee to the Diagnostic Imaging Accreditation Scheme (DIAS) and were endorsed by professional and industry groups. The revised DRLs were published on ARPANSA's website in June to come into effect from 1 July 2018. An updated version of the NDRLS web portal, adapted to the revised DRLs and incorporating other improvements, was prepared and tested over a period of several months ahead of the release of the revised DRLs. The updated web portal is expected to commence operation on 2 July 2018. DIAS and the Radiation Health Committee agreed regulatory bodies will continue to accept comparisons against the older DRLs through to the end of 2018. From 1 January 2019, all DRL comparisons for adult MDCT protocols must be against the new DRLs.

Ensuring risk-informed and efficient regulation

Significant activities

On 7 June, ARPANSA was notified of an incident at ANSTO Health which resulted in a vial of molybdenum-99, a radioactive substance, being spilled on the floor after a wheel came off the trolley being used to move it. Although the incident did not result in any significant radioactive contamination or exposure of staff, the CEO of ARPANSA decided to issue a direction to ANSTO under section 41(1A) of the Act as this was one of several safety incidents in recent months. The details of the direction are described later in this report.

An ARPANSA source licence was issued to the Australian National Maritime Museum (ANMM) for the first time. ANMM typically deals with legacy historical articles, such as watches, compasses and other dials which contain radium paint.

On 12 April 2018, the CEO of ARPANSA issued a licence to operate the ANSTO Nuclear Medicine facility. This followed an assessment period of over one year by ARPANSA. The CEO invited public submissions on the application and sought advice from the ARPANSA Nuclear Safety Committee before issuing the licence. A detailed Statement of Reasons by the CEO can be found on the ARPANSA website at: www.arpansa.gov.au/sites/g/files/net3086/f/statement_of_reasons_sor_-_anm_operations.pdf.

Inspections

Nine planned inspections and 17 site visits were conducted during the quarter which identified one potential non-compliance and 20 areas for improvement. The inspection reports can be found on ARPANSA's website at *www.arpansa.gov.au/regulation/inspections/reports.* An additional inspection was conducted at ANSTO Health to investigate an incident involving a spill of a radionuclide solution as described above.

Stakeholder engagement

ARPANSA held a 'meet-the-regulator forum' with licensed entities in Adelaide, South Australia, on 6 June 2018. The purpose was to engage operational staff of licensed entities and share information collected and analysed from ARPANSA's source inspection program over the past two years. The event resulted in positive feedback and other forums are expected to be held across other states.

ARPANSA hosted a periodic Defence-ARPANSA Liaison Forum (DALF). The DALF meets annually to discuss licensing and compliance activities. Defence provided an overview of their priorities for 2018 and beyond. ARPANSA provided advice on its priorities and its expectations of licence holders. Defence was able to share the findings of its internal audit program which aims to identify and rectify radiation safety and regulatory compliance matters in advance of ARPANSA's independent inspection program. Both agencies committed to continue to sustain dialogue in order to progress a number of outstanding assessments and licensing decisions.

Radioactive material import and export permits

The importation and exportation 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.

ARPANSA's authorised officers approved 61 urgent permits, 64 standard permits, and eight 12-month permits for non-medical radioisotopes.

ARPANSA's authorised officers approved 165 permits for medical radioisotopes in the form of nine 12-month permits and 156 single shipment permits.

Nine permits to export high activity radioactive sources were approved.

Transport of radioactive material

ARPANSA endorsed two transport security plans for the transport of radioactive material.

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 for taking stock of international developments to ensure ARPANSA's regulatory framework and radiation protection standards are based on international best practice. The following is a summary of key international engagement activities undertaken in this quarter.

National Institute of Water and Atmospheric Research (NIWA) Ultraviolet (UV) Workshop, 4–6 April 2018, Wellington, New Zealand

ARPANSA participated in this NIWA workshop, which discussed the effects of UV radiation on human health and the environment. Key outcomes were engagement with organisations and researchers having similar interests in reducing the burden of disease from solar UV exposure. This travel was funded by ARPANSA.

IAEA International Regulatory Review Service (IRRS) Preparatory Meeting, 9–10 April 2018, Vienna, Austria

ARPANSA, including CEO Dr Carl-Magnus Larsson, attended this meeting to discuss Australia's preparations for the IRRS mission to Australia in November 2018. The key areas of discussion were on the preliminary findings of the self-assessment modules, objectives for national uniformity of radiation regulation, logistical issues concerning the mission (such as information technology support, security, scheduling), and how to integrate state and territory input effectively. This travel was funded by ARPANSA.

43rd Meeting IAEA Commission on Safety Standards (CSS), 9–13 April 2018, Vienna, Austria

ARPANSA, including CEO Dr Carl-Magnus Larsson, attended the CSS meeting in the capacity of the Australian member of the Committee. CSS sets the policy direction for the five Safety Standards Committees on radiation, nuclear, waste and transport safety, and on emergency preparedness and response. CSS approved a number of new safety standards for publication and approved the 'document preparation profiles' for 11 revisions of safety standards for research reactors, an important area for Australia. CSS also decided to move towards a review of the Safety Fundamentals, the top tier document in the safety standards hierarchy. Australia is one of the member states driving this work, which is informed by recent assessments of the UN Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the need to improve communication around risks and safety with all stakeholders. This travel was jointly funded by IAEA and ARPANSA.

IAEA IRRS and Integrated Review Service for radioactive waste and spent fuel management, decommissioning and remediation ('ARTEMIS') Missions, 18–19 April 2018, Madrid, Spain

The CEO of ARPANSA attended a two-day preparatory meeting for the above combined missions to Spain in October (IRRS/ARTEMIS). The CEO of ARPANSA will lead the IRRS part of the mission, with a team of about 20 international experts. The discussions took place in the headquarters of the Spanish Nuclear Safety Council. The scope and organisation of the mission was agreed. The IAEA coordinates the IRRS missions, which have become a cornerstone in the international framework for safety. This travel was jointly funded by the IAEA and ARPANSA.

European Society for Radiotherapy and Technology (ESTRO) Conference and National Physical Laboratory (NPL) visit and dosimetry audit comparison, 18–29 April 2018, Barcelona, Spain and London, United Kingdom

ARPANSA attended the ESTRO conference, which also hosted the Global Harmonisation Group (GHG) workshop in Barcelona, Spain from 20–24 April 2018. ESTRO presents leading researchers and clinical practitioners engaged with defining and understanding the key existing and emerging risks within radiation therapy. ARPANSA staff were awarded their first oral presentation highlighting our progression towards delivering a world-leading audit service ensuring the highest quality of patient safety in Australia. The second component of this travel saw ARPANSA attend the NPL to participate in a dosimetry audit inter-comparison with international peers. This is the most effective method to benchmark different audit

approaches developed internationally. This travel was funded by ARPANSA and the Royal Melbourne Institute for Technology.

Technical Meeting on the International Nuclear and Radiological Event Scale (INES) 23–27 April 2018, Vienna, Austria

ARPANSA attended this meeting which focused on a detailed review of the new revision draft of the INES Users' Manual, which details how and when countries should report certain radiological events to the IAEA and international community. This travel was funded by ARPANSA.

International Commission on Radiological Protection (ICRP) Main Commission, 26 April–2 May 2018, Quebec City, Canada

The CEO of ARPANSA attended this meeting in connection with a meeting of the Canadian Radiation Protection Association. The ICRP's recommendations underpin the international system for radiological protection, which is implemented in Australia. The Main Commission meeting sets the policy direction for the Commission's work and approves its reports. A number of reports were approved for public consultation, on protection quantities; and on dosimetry for paediatric medicine, therapy, and public exposure. ARPANSA is co-hosting the next ICRP Symposium in Adelaide in November 2019, with the theme Mines, Medicine, Mars. This travel was funded by ARPANSA.

IAEA Technical Meeting on Preventing Unintended and Accidental Exposures in Nuclear Medicine, 16–18 May 2018, Vienna, Austria

ARPANSA participated in a meeting which aimed to review the causes of and the contributing factors to the unintended and accidental exposure during the different steps of the nuclear medicine process, and define actions for preventing such incidents. Key outcomes were an ongoing dialogue with relevant international bodies to learn from incidents in the nuclear medicine space and to provide education to practitioners to ensure high level of radiation protection of patients. Furthermore the meeting recommended to upgrade the IAEA voluntary reporting and learning system for Safety in Radiation Oncology to also include radionuclide therapy. This travel was funded by ARPANSA.

6th Review meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 21 May to 1 June 2018, Vienna, Austria

ARPANSA led the Australian delegation for this review meeting. During the meeting, the 69 countries attending as Contracting Parties under the Joint Convention reviewed the implementation of obligations under the Joint Convention. This included discussions on implementation of national strategies for spent fuel and radioactive waste management, long-term management of spent fuel, human resources for disposal, regulatory effectiveness, long-term management and disposal of sealed radioactive sources, and remediation of legacy sites and facilities.

The Contracting Parties agreed to the scope of national reports for the 7th review meeting, and agreed that an Extraordinary Meeting be held prior to the Organisational Meeting of the 7th Review meeting to discuss improvements to procedural mechanisms of the Joint Convention. By participating in the Review Meeting, Australia continues to meet its obligations as a Contracting Party to the Joint Convention. Travel for ARPANSA delegation members was funded by ARPANSA.

36th Meeting of the International Atomic Energy Agency (IAEA)'s Transport Safety Standards Committee (TRANSSC) 4–8 June 2018, Vienna, Austria

This meeting focussed on the revision of the IAEA Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material 2012 Edition (Specific Safety Guide No. SSG-26) and the final publication of the IAEA Regulations for the Safe Transport of Radioactive Material 2018 Edition (Specific Safety Requirements No. SSR 6 (Rev. 1)). Specific Safety Guides to SSR-6 are used by industry and regulators and provide important information for addressing the requirements of SSR-6. The Package Design Safety Report guide will contain guidance for package design approvals undertaken by ARPANSA and other Competent Authorities within Australian jurisdictions. Application of this safety guide will ensure consistency in package design assessment approaches taken by other competent authorities of other countries. The meeting was funded by ARPANSA.

44th meeting of the IAEA Radiation Safety Standards Committee (RASSC), 6–8 June 2018, Vienna, Austria

ARPANSA's attendance at this meeting is important since it allows Australia to contribute to, and influence, the development of safety standards for radiation protection. This, in turn, allows for the efficient implementation of international best practice in Australia, a requirement of the ARPANS Act. Key outcomes were the commitment to participate in the preparation of safety report on issues arising from the UNSCEAR 2012 Report *Attributing Health Effects to Radiation Exposure and Inferring Risks*, and to conduct a review of the IAEA Safety Fundamentals SF-1. This travel was funded by ARPANSA.

65th Annual Session of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) 10–14 June 2018, Vienna, Austria

The Deputy CEO of ARPANSA is the Australian Head of Delegation and Representative to UNSCEAR and the Committee's Rapporteur. UNSCEAR undertakes scientific assessments of radioactive sources and the effects of ionising radiation, including health risks to people and the environment and reports its findings directly to the United Nations (UN) General Assembly. UNSCEAR reviewed progress of its current program of work and will continue work on a number of projects, including the surveys on medical exposures and occupational exposures. ARPANSA representatives have been primary contributors to the expert groups undertaking both of these surveys, and will continue to provide data and support to these projects. The ability of UNSCEAR to approve commencement of work on new projects during the session was impeded by the ongoing delays in recruiting a new Scientific Secretary to the Committee. This matter was of serious concern to UNSCEAR, and consequently, the Australian Missions in Nairobi and New York (in cooperation with other UNSCEAR member countries) continue to seek a timely resolution from UN Environment and the UN Secretary General's Office with regard to this matter. This travel was funded by the UN and ARPANSA.

5th Consultancy Meeting for the Development of Training Material for Security of Nuclear and Other Radioactive Material in Transport, 11–14 June 2018, Vienna, Austria

ARPANSA attended this meeting on drafting and developing workshop materials on transport security for nuclear and other radioactive materials. The participants provide advice on developing training material for international regulatory and security requirements for member states. The emphasis for developing these materials focused upon utilising a graded-approach which took into consideration the broad range of member states who require guidance and their varied nuclear industry footprints. This travel was funded by ARPANSA.

6th meeting of the IAEA Emergency Preparedness and Response Standards Committee (EPReSC), 11–14 June 2018, Vienna, Austria

ARPANSA participated in this meeting which discussed several draft safety and security standards documents and held a joint session with the Nuclear Security Guidance Committee (NSGC). Key outcomes saw all safety standards approved to go to the next step in the SPESS (Strategies and Processes for the Establishment of IAEA Safety Standards) process, some with conditions. This travel was funded by ARPANSA.

9th Meeting of the Representatives of Competent Authorities identified under the Early Notification Convention and the Assistance Convention, 18–22 June 2018, Vienna, Austria

ARPANSA is the National Competent Authority under these conventions. The meeting discussed numerous topical areas related to radiological and nuclear emergency preparedness and response (EPR). Key outcomes were a suite of conclusions with non-binding actions on both Member States and the IAEA Secretariat to improve the international EPR system. This travel was funded by ARPANSA.

World Health Organisation (WHO) International Advisory Council (IAC), 18–22 June 2018, Portoroz, Slovenia

ARPANSA attended this meeting, which summarised recent scientific research outcomes on dosimetry and health effects of non-ionising radiation that may influence health standards, and exchanged knowledge on best practice. ARPANSA is an international World Health Organization (WHO) Collaborating Centre on Radiation Protection and is a member of the WHO Electromagnetic Fields Project and the WHO INTERSUN Project. The work done by WHO on the development of the Non-Ionising Radiation Basic Safety Requirements and Fundamental Safety Principles will strongly influence the development of similar guidance in Australia. ARPANSA funded this travel.

21st Session of the Radioactive Waste Management Committee (RWMC) Regulators Forum and the 51st Session of the RWMC, 24–26 April 2018, Paris, France

The discussions at this forum included the challenges in gaining and maintaining competency of regulators and regulatory challenges in managing waste where there are no existing disposal routes. The Committee tabled and discussed reports from its working groups such as on the predisposal management of radioactive waste and waste inventorying and reporting methodology. The committee drafted future work programs for RWMC members. The travel was funded by ARPANSA.

IAEA Regional Training Course on Radiochemical Analysis of Marine Environmental Samples, 4–15 June 2018, Melbourne, Australia

ARPANSA and the IAEA hosted and coordinated the training course, with participants from 12 countries at its Yallambie laboratory over a two-week duration. The course comprised a series of lectures as well as practical laboratory work, with ARPANSA providing the logistical organisation, facilities and specialist lecturers.

IAEA National Dose Registry Workshop, 24–25 May, Melbourne, Australia

ARPANSA and the IAEA hosted and coordinated a Regional Workshop on the Establishment and Maintenance of a National Dose Registry. Drawing upon Australian and international experts, the workshop provided an opportunity for knowledge sharing on the best practice approaches for establishing and maintaining a national dose registry. Thirty participants from the Asia-Pacific region presented the status of their national dose registries, challenges they face in implementing and operating a registry, and lessons learned.

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

On 29 June 2018, a direction was given to ANSTO by the CEO of ARPANSA under section 41(1A) of the Act with regards to activities carried out by ANSTO Health under licence F0262 in Building 23, Lucas Heights Science and Technology Centre, NSW.

The Direction was issued following four separate events with safety implications, including the event described in another report tabled in Parliament under section 61(1) of the Act on 26 February 2018. A copy of the direction will published on ARPANSA's website after it is tabled in the Parliament.

The direction required ANSTO to:

i) take immediate steps to initiate an independent review of the approach to occupational radiation safety of processes and operational procedures in Building 23, in particular those associated with quality control of Mo-99 samples;

ii) appoint an external reviewer and, as necessary, external experts to support the reviewer in carrying out their task including providing recommendations to ANSTO with regard to relevant practices at ANSTO;

   a) the external reviewer and supporting experts must be considered suitable for the task by ARPANSA before being appointed by ANSTO;

   b) the terms of reference for the review must be approved by ARPANSA;

iii) support the review in any way necessary, including but not limited to providing access to facilities and documentation, as well as access to staff under arrangements that enable staff to interact openly with the reviewer;

iv) provide ARPANSA with a progress report 30 days after commencement of the review;

v) within 60 days after commencement of the review, provide ARPANSA with the final report, including the recommendations by the reviewer and ANSTO's response to those recommendations; and

vi) at the same time, provide a plan and associated timelines for the implementation of actions responding to the report's recommendations for ARPANSA's approval.

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

Two breaches with minor safety implications were recorded in the quarter. Both breaches were for failing to comply with licence conditions under the Australian Radiation Protection and Nuclear Safety Regulations 1999. A summary of the breaches is as follows:

- Regulation 49 – failing to comply with plans and arrangements for managing safety
- failing to notify the CEO of a breach under Regulation 45(3)

There were no beaches identified with significant safety implications this quarter.

Facilities licensed under Part 5 of the ARPANS Act

During the quarter a licence was issued to the ANSTO to operate the ANSTO Nuclear Medicine facility. For more details, see page 5.

The operations of the Council and Committees

Radiation Health and Safety Advisory Council

The Radiation Health and Safety Advisory Council (Council) did not meet during this quarter. The terms of seven members of the Council, including the Chair, expired on 30 June 2018.

The minutes of past meetings are on ARPANSA's website at www.arpansa.gov.au/rhsac. The next meeting is scheduled for 11 October 2018 in Sydney.

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

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

Radiation Health Committee

The Radiation Health Committee (RHC) did not hold a meeting this quarter.

The minutes of past meetings of the RHC are provided online at www.arpansa.gov.au/rhc. The next RHC meeting is scheduled for 17–18 July 2018 in Hobart.

Nuclear Safety Committee

The Nuclear Safety Committee (NSC) met on 22 June 2018 in Miranda, New South Wales.

The NSC reviewed and provided comment on a submitted ANSTO Health high hazard risk assessment. The NSC was also informed of ARPANSA's regulatory activities, including the direction issued to ANSTO outlined above (see 'Details of directions given by the CEO'). The members in attendance unanimously endorsed ARPANSA's proposed enforcement approach of issuing a direction in relation to the events in Building 23. This direction would require an external independent review of ANSTO Health processes and procedures associated with quality control of Molybdenum-99.

The minutes of the meeting are provided online at www.arpansa.gov.au/nsc. The next meeting of the NSC is scheduled for 2 November 2018 in Miranda.

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.