Australian Government

Australian Radiation Protection and Nuclear Safety Agency

arpansa

Quarterly Report

of the

Chief Executive Officer of ARPANSA

April to June 2019

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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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Letter of transmittal

22 October 2019

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 April to 30 June 2019.

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 2018-19 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 2018-19 PBS, describes four performance criteria, 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 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

ARPANSA expands ultraviolet radiation monitoring

In May 2019, ARPANSA announced that it will be partnering with the Central Highlands Regional Council to establish Queensland's fourth location for collection of real time ultraviolet (UV) data. The planned installation of a UV sensor in Emerald, Queensland adds to the existing network of UV monitoring equipment in 16 locations across Australia and Antarctica. The sensor to be installed in Emerald responds to UV radiation similarly to human skin, producing a UV Index value that is reported on the ARPANSA website every minute. Real-time monitoring is a vital resource in protecting Australians from the harmful effects of UV radiation. With an increase in the prevalence of deadly skin cancers such as melanoma, it is important to know when UV reaches levels that can cause harm.

Misinformation about 5G and health

In June 2019, ARPANSA published advice in response to misinformation that has been circulating throughout the community about the possible health impacts of Australia's planned roll-out of 5G, the new generation of the mobile network. Mobile phone networks and other wireless telecommunications sources emit low-level radiofrequency electromagnetic energy and some members of the public have some concerns of adverse health effects. ARPANSA has seen an increase in misinformation that is generating unfounded fear and concern within the community. The ARPANSA advice provides evidenced based information about 5G and urges the public to be cautious of claims from anti-5G campaigns.

Australian pilots and health

In May 2019, ARPANSA co-authored a new study which found that modern airline pilots registered in Australia are not at a higher risk of developing invasive melanoma than the rest of the population. The study was led by QIMR Berghofer Medical Research Institute in collaboration with the Civil Aviation Safety Authority and ARPANSA. The findings reflect that conditions on airliner flights have changed, and factors such as levels of solar ultraviolet radiation associated with melanoma are mostly extremely low on today's airliner flight decks. This study is significant because it is a change from previous findings that focused on pilots in the northern hemisphere which showed higher risks of melanoma for pilots. This research provides a better understanding of the occupational risk of non-ionising radiation exposure to aircrew.

Occupationally exposed workers in Australia

In April 2019, ARPANSA commenced user testing as part of a project to make improvements to the employer interface of the online portal for the Australian National Radiation Dose Register (ANRDR). The ANRDR is a database which stores and maintains radiation dose records for workers occupationally exposed to radiation in Australia. The work will result in the capture of additional critical information on dose assessment methodologies ensuring that records are traceable to identified service providers and methodologies, allowing for future verification and improved data quality. It will also feed information contained in the ANRDR directly back to employers, to improve the identification of individuals and provide access to uploaded files for record management, ultimately better tracking radiation doses for workers.

The ANRDR data helps to inform better work practices and improve radiation safety for occupationally exposed workers in Australia. Currently the ANRDR holds dose records for around 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. The ultimate goal for the ANRDR is to cover all occupationally exposed workers in Australia and work to ensure this is in progress.

ARPANSA Accreditation – transitioning to an updated version of ISO 17025

In May 2019, the National Association of Testing Authorities (NATA) confirmed that ARPANSA's accredited services are competent to carry out testing, calibration and related technical activities in accordance with the new ISO/IEC 17025 standard. This followed an assessment of ARPANSA's seven laboratories that maintain this accreditation. In 2017, a new version of the standard was released and all accredited facilities are required to demonstrate compliance with the new standard. Maintaining this accreditation for ARPANSA's laboratories and recognised competencies demonstrates to the public that our research and testing facilities are independent and unbiased, and demonstrates ARPANSA's transparency to the public.

Waste store expansion project

During 2018-19, a demolition and remediation project was undertaken at a laboratory site formerly occupied by ARPANSA's predecessor agencies. This work resulted in the production of approximately 230 drums of building materials or soil contaminated with radium, which was classified as low-level radioactive waste. In order to ensure that this waste is managed in accordance with international best practice, ARPANSA has taken ownership of this legacy waste. A dedicated waste store has been constructed within ARPANSA's Yallambie building to store this waste to a standard that exceeds safety and security

requirements. This is an important example of appropriate storage of low-level waste prior to disposal, consistent with protection of the public and environment from the harmful effects of radiation.

Promoting radiological and nuclear safety and security, and emergency preparedness

Publication of the Guide for Radiation Protection in Emergency Exposure Situations

ARPANSA published the *Guide for Radiation Protection in Emergency Exposure Situations* (Radiation Protection Series G-3, Parts 1 and 2) in May 2019. This Guide provides the framework in Australia for the protection of emergency workers, helpers, the public and the environment in emergency exposure situations as well as providing guidance for the planning, preparedness, response and transition required to effectively respond to an emergency.

Nuclear powered warship visits

ARPANSA conducted a validation from 9–10 April 2019 of the Port of Brisbane's plans and arrangements for a nuclear powered warship (NPW) visit. This process included participation in an exercise conducted by Queensland emergency services to ensure roles and responsibilities in response plans were understood by all parties. ARPANSA undertakes this in its capacity as a member of the Visiting Ships Panel (Nuclear), an Australian Government committee which oversees arrangements for NPW visits to Australian ports.

Two additional radiation monitoring stations were also installed at the Port of Brisbane this quarter as part of the implementation of the Australian Radiation Monitoring System (ARMS). ARMS is being established to monitor Australian ports that host visits from NPW's and to support national preparedness for a potential radiological or nuclear accident (see https://www.arpansa.gov.au/news/arpansa-establishing-radiation-monitoring-network). Data continue to be available from the ARMS system through an online portal and improvements to the reliability of the service was also made during the quarter.

Emergency training, drills and exercises

ARPANSA attended a multi-agency chemical, biological, radiological, nuclear (CBRNe) responder education workshop on 17 April 2019. Coordinated by Victoria Police (VicPol) and the Melbourne Fire Brigade (MFB), it aimed to define individual agency CBRNe responder standards to operate in a potentially contaminated environment. The workshop was attended by VicPol, MFB, Country Fire Association, Victorian Department of Health and Human Services, Ambulance Victoria, ARPANSA and the Australian Defence Force. Through its participation as a recognised subject matter expert, ARPANSA could directly promote Australia's radiological and nuclear emergency preparedness, raise awareness of the upcoming publication of the Guide for Radiation Protection in Emergency Exposure Situations and understand jurisdictional issues which may need addressing at a national level.

ARPANSA enhanced its analytical capability for field teams and reachback services (the ability to obtain products, services, and applications, or forces, or equipment, or material from organisations that are not forward-deployed) with the receipt of training from United States Department of Energy on the Gamma Detector Response and Analysis Software (GADRAS). The training and upskilling of staff on this software provides an opportunity to expand the range of detectors ARPANSA can analyse beyond what is currently in operational service for ARPANSA response teams. This will increase the level of support ARPANSA can provide to external stakeholders for enhanced characterisation of radiological material in the case of a radiological or nuclear event.

Medical imaging

ARPANSA's National Diagnostic Reference Level Service (NDRLS) received 625 surveys of patient dose in computed tomography (CT) scans during the quarter, compared with 435 for the same period last year. A total of 3853 surveys were received in 2018–19, compared with 2779 in 2017–18; well in excess of the target of 1400. The NDRLS survey, completed by participating imaging facilities, collect data on metrics for patient dose from ionising radiation in diagnostic imaging, particularly for CT. ARPANSA uses this data to calculate Australian diagnostic reference levels (DRLs) for common types of CT scans. The DRLs provide a point of comparison so a given imaging facility can compare their practice with that of their peers. A larger data sample gives increased confidence in the DRLs that ARPANSA sets. The aim of DRL comparisons is to encourage imaging facilities to review their practice and thereby ensure an appropriate balance of benefit and risk for patients. This helps to avoid excessive radiation dose to patients from medical imaging.

Primary Standards Dosimetry Laboratory

As a part of ARPANSA's regular calibration services for radiotherapy providers and medical industry users of ionising radiation, ARPANSA calibrated nine therapy dosimeters and nine electronic personal dosimeters. Clinics use therapy dosimeters to determine the radiation dose delivered during radiotherapy. Accurate radiation dose delivery is vital for treatment efficacy and patient safety. Two hundred and eighty eight neutron monitors were irradiated for the ARPANSA personal radiation monitoring service to enable them to accurately measure doses to radiation workers in Australia.

Ensuring risk-informed and efficient regulation

Significant regulatory activities

During the quarter, ARPANSA issued the following regulatory approvals:

- On 3 April 2019, the Australian Nuclear Science and Technology Organisation (ANSTO) was approved to undertake a limited series of 30 manufacturing runs at the ANSTO Nuclear Medicine (ANM) Facility.
- On 24 May 2019, ANSTO's ANM Facility Licence was amended to authorise the move to routine operations at the ANSTO ANM Facility.
- A number of applications were approved for the ANSTO Open-Pool-Australian-Lightwater (OPAL) reactor facility, for the 'Fuel Swage Strength Testing' and 'Measurement of Irradiation Molybdenum Plate Power' projects.
- ANSTO Waste Operations was given an approval for the Building 20B extension to move to routine operation.

On 21 June 2019, ARPANSA was notified of a radiation contamination event at the ANM Facility at Lucas Heights, New South Wales. Three workers were accidentally exposed to radiation, with two of the workers receiving a dose that exceeded the statutory annual dose limit for the hands, resulting in ARPANSA giving the accident a preliminary rating of Level 2 on the International Nuclear and Radiological Event Scale (INES) which rates all radiological events from minor anomalies to major radioactive accidents on a scale of 1 to 7. Production was halted and ARPANSA inspectors conducted a visit to the site on the day of the accident, and again on Monday 24 June 2019. ARPANSA instructed ANSTO to not resume operations until ARPANSA had assessed how and why the accident happened, and reviewed ANSTO's own assessment of

the accident including their proposed controls to keep workers safe. ARPANSA published a public statement on 26 June 2019 at www.arpansa.gov.au/news/contamination-event-ansto-nuclear-medicine-facility.

ARPANSA held meetings with Comcare regarding updates on recent safety incidents at ANSTO, ANSTO's action plan to address recommendations in the independent safety review of ANSTO Health, and ARPANSA's recent safety culture assessment. ARPANSA is currently conducting an assessment of the safety culture of its own operations, as an example of international best practice.

ARPANSA has issued a licence to Norfolk Island Health and Residential Aged Care Service (NIHRACS) for the use of their medical diagnostics and dental X-ray units. This is a significant milestone for Norfolk Island as the Commonwealth Department of Health are embarking upon changes to the Medicare registration guidelines which will allow Norfolk Island to qualify for Medicare for these services in the future.

Inspections

ARPANSA conducted fourteen scheduled 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 is determined by an assessment of the risk presented from the controlled activity and takes into account a range of factors including licence holder safety performance.

This quarter's inspections identified one potential non-compliance, the same number as the previous quarter, and 41 areas for improvement, compared with five in the previous quarter. 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. If confirmed these will be 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 at ARPANSA's website at www.arpansa.gov.au/regulation/inspections/reports.

Standards development

ARPANSA published the *Guide for Radiation Protection in Emergency Exposure Situations* (2019), Radiation Protection Series (RPS) G-3. This guide describes objectives for protection of human health, drawing upon international best practice in relation to planning, preparedness, response and transition in nuclear or radiological emergencies. It supersedes the RPS No. 7 *Recommendations for Intervention in Emergency Situations Involving Radiation Exposure* (2004), and is available at: https://www.arpansa.gov.au/regulation-and-licensing/regulatory-publications/radiation-protection-series/guides-and-recommendations.

ARPANSA published the *Code for the Safe Transport of Radioactive Material* (2019), Radiation Protection Series C-2 (Rev. 1) (commonly referred to as the Transport Code). This edition of the Transport Code adopts the *International Atomic Energy Agency Regulations for the Safe Transport of Radioactive Material 2018 Edition* (SSR-6, Rev. 1) and replaces the 2014 edition (RPS C-2). The Transport Code's objective is to establish uniform requirements for the transport of radioactive material in Australia by road, rail and those

waterways not covered by maritime legislation. It is available at: https://www.arpansa.gov.au/regulation-and-licensing/regulatory-publications/radiation-protection-series/codes-and-standards/rpsc-2.

Stakeholder engagement

The CSIRO-ARPANSA Liaison Forum was held in June 2019. This forum allows for the sharing of strategic priorities for each agency and operational matters can be discussed. Discussions at the forum focussed on legacy radioactive materials and strategies to improve their management.

ARPANSA hosted a 'Meet the Regulator' forum in Hobart, Tasmania on 8 May 2019. These forums allow for the technical exchange of information between licensed entities and allows for radiation safety officers to gain an appreciation of where ARPANSA places importance on licence holder performance.

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, ARPANSA officers are authorised to issue import and export permits. Permits ensure that radioactive material entering and exiting the country is subject to appropriate regulatory control. This includes 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. The efficient movement of nuclear medicine internationally is particularly important to ensure that patients receive appropriate imaging and therapy.

Permits issued this quarter:

Type of permits	*Urgent (single shipment)*	*Standard (single shipment)*	*12-month*
Import of non-medical radioisotope	59	56	8
Import of medical radioisotope	-	166	9
Export of high activity source	-	12	-

Transport of radioactive material

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

ARPANSA endorsed 11 transport security plans this quarter. Under the *Code of Practice for the Security of Radioactive Sources* (2019) RPS No. 11, security enhanced sources are assessed to ensure the safety and security considerations, including the transport arrangements and route, are suitable for the shipment.

ARPANSA validated the package design of a Type B(U) package issued by the Competent Authority of France and issued a validation certificate to ANSTO. The package will be used for transporting OPAL fresh fuel and targets for molybdenum-99 as part of the nuclear medicine production process.

ARPANSA approved the transport of un-irradiated OPAL fuel assemblies and uranium target plates from Sydney Airport to ANSTO Lucas Heights, and issued ANSTO with a shipment certificate.

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.

Integrated Regulatory Review Service mission to Germany, 31 March to 12 April 2019, Bonn, Germany

ARPANSA participated in an International Atomic Energy Agency (IAEA) coordinated mission which reviewed the legal framework for nuclear, radiation and waste safety in Germany. The Deputy Executive Director for Operations of the United States Nuclear Regulatory Commission led the mission and the review team involved 17 international experts and four IAEA staff. Discussions were held with the German Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU), the Federal Office of the Safety of Nuclear Waste Management (BfE), and representatives of the regulatory bodies of seven Länder (German states). IAEA peer-review missions of this nature have become cornerstones in the international framework for safety. This travel was partly funded by the IAEA and by the German hosts.

Asia & Pacific Regional Workshop on Applying the IAEA General Safety Requirements (GSR) Part 3, 15–18 April 2019, Singapore

An ARPANSA officer chaired this IAEA-sponsored workshop which provided an opportunity for Member States to share practical experience of the application of the GSR Part 3 and discuss how to address identified challenges. The workshop was one of four held in the regions of Asia & Pacific, Europe, Africa, and the Americas. Information and lessons learned from these workshops will feed into the work of the Program Committee for the IAEA International Conference on Radiation Safety to be held in Vienna in 2020. This travel was funded by the IAEA.

European Society of Radiotherapy and Oncology (ESTRO) conference, 26–30 April 2019, Milan, Italy

ARPANSA contributed to this event which is the most highly regarded international multi-disciplinary conference on radiation oncology. The conference discusses new research developments as well as current and emerging technologies in the field of radiation oncology. Included in this travel was a meeting (immediately prior to ESTRO) of the Radiotherapy Clinical Trials Global Harmonisation Group (GHG), of which ARPANSA's Australian Clinical Dosimetry Service (ACDS) is a member. This Annual Meeting brings together international dosimetry auditing groups such as the ACDS to discuss and promote harmonisation of quality assurance in radiotherapy clinical trials. This travel was partly funded by ARPANSA, RMIT University and The Alfred Hospital.

IAEA Regional Cooperative Agreement (RCA) Regional Workshop, 29 April to 3 May 2019, Penang, Malaysia

An ARPANSA staff member attended the workshop on Implementation of Quality Management System in Radioanalytical Laboratories involved in Marine Radioactivity Studies and presented on aspects of Quality Management with a particular focus accredited laboratory systems. The aim is to ensure reliable quality assured results are used in the marine environmental monitoring of Nuclear Power Plants and Facilities in the region. ARPANSA also provided training to other country participants in aspects of method validation using multivariate testing. This travel was funded by the IAEA.

Meeting of the Main Commission of the International Commission on Radiological Protection (ICRP), meeting with National Aeronautics Space Agency (NASA), meeting with Imaging and Radiation Oncology Core (IROC) Radiotherapy QA Centre, 2–8 May 2019, Houston, USA

The CEO of ARPANSA attended the meeting of the ICRP Main Commission, which coordinates the work carried out by about 200 experts around the world to improve the international system for radiological protection. A number of draft documents were approved for publication, or for public consultation for 90 days. Meetings were held with NASA regarding emerging lunar and deep space exploration projects, which entail specific radiation risks. In the margins, the CEO also visited the IROC Radiotherapy QA Centre in Houston. ARPANSA has set up the ACDS to audit Australian radiotherapy centres and is collaborating with IROC in establishing quality programs for new technologies in radiation therapy. The travel was funded by ARPANSA.

IAEA Training Workshop on a Continuous Safety Culture Improvement Process for Safety Culture Experts, 20–24 May 2019, Vienna, Austria

ARPANSA participated in this training workshop which focused on the conduct of safety culture self-assessments and their outcomes. The IAEA offers comprehensive support to licensees and regulatory bodies wishing to systematically improve their safety culture including training on the IAEA preferred approach to conduct safety culture assessments and implement improvement activities based on their findings. In addition to ARPANSA's own current assessment of the safety culture of its own operations, as an example of international best practice, ARPANSA has also developed a custom safety culture maturity model and used this to assess its regulatory safety culture assessment. This travel was funded by ARPANSA.

1st Meeting of the Program Committee for the IAEA International Conference on Radiation Safety (2020), 21–24 May 2019, Vienna, Austria

ARPANSA was invited to participate and attend this meeting to discuss the proposed technical content of the upcoming IAEA conference, and work with IAEA personnel in planning and organising the conference. The focus of the conference is the practical challenges faced in applying the system of radiological protection and, as such, will cover all exposure situations and categories of exposure. A place in the Committee provides an opportunity for ARPANSA to influence the program of the conference, which in turn will inform future revision of the IAEA's General Safety Requirement Part 3 international standard. This travel was funded by the IAEA.

World Health Organisation (WHO) Annual International Advisory Committee (IAC) Meeting on Non-Ionising Radiation, 26–29 May 2018, Geneva Switzerland

ARPANSA is an international WHO Collaborating Centre on Radiation Protection and attended this meeting as a committee member and Chair. The meeting presented IAC representatives with the work done by WHO on the development of the *Basic Safety Requirements for Non-Ionising Radiation* (BSR NIR). The BSR NIR will strongly influence the development of similar guidance in Australia. It sets out the basic safety criteria which represent a broad approach that guides governments throughout the life of non-ionising radiation services. Attendance at the annual meetings is one of ARPANSA's commitments in its role as a WHO Collaborating Centre and provides an opportunity for ARPANSA to influence the direction of WHO activities. This travel was funded by ARPANSA.

Open-Ended Meeting of Technical and Legal Experts for Sharing Information on States' Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources and its Supplementary Guidance, 27–31 May 2019, Vienna, Austria

ARPANSA represented Australia at this meeting which reviewed Member States' experiences in implementing the Code of Conduct and its Guidance across the full life-cycle of radioactive sources. Consensus and strengthened emphasis was placed on ensuring that radioactive material that enters the scrap-metal and smelting industries is detected and managed appropriately in order to prevent radioactive sources from entering the supply chain of consumer products, and ensuring that, when identified, the sources can be re-placed under regulatory control in a safe and secure manner. The conference also heavily focused on Member States' ability to consolidate waste repositories into a single disposal facility. Securing such a facility minimises the costs to Member States associated with hardened safety and security measures. Member States also shared experiences for disposing disused radioactive sources using borehole drilling techniques. This travel was funded by ARPANSA.

IAEA Emergency Preparedness Review (EPREV) mission, 3–13 June 2019, Ottawa, Canada

ARPANSA participated in this mission which reviewed Canada's arrangements and capabilities to respond to nuclear and radiological emergencies at nuclear power plants against the requirements of the IAEA Safety Standards. Key outcomes were a report on the Canadian national system which included mentions of five Good Practices, six Recommendations and six Suggestions to improve their emergency preparedness and response arrangements. Participation in the EPREV mission helps strengthen nuclear safety and emergency preparedness in Member States and provides on opportunity to share lessons and good practices between countries. ARPANSA now has a better understanding of the EPREV process and resource requirements, should a commitment be made to host an EPREV in the future. This travel was jointly funded by ARPANSA, IAEA and the Canadian Government.

Consultative Committee for Ionising Radiation (CCRI) meetings, 5–14 June 2019, Paris, France; and International Symposium on Standards, Applications and Quality Assurance in Medical Radiation Dosimetry (IDOS) 2019, 18–21 June 2019, Vienna, Austria

ARPANSA attended a meeting of section I of the CCRI, of which ARPANSA is a member, and the main CCRI meeting at the International Bureau of Weights and Measures (BIPM). The progress of international comparisons of standards for dosimetry and the developments in the field of dosimetry at all primary standards laboratories were discussed. Key outcomes included the adoption of new key data for ionising

radiation dosimetry, which will significantly change worldwide measurements of air kerma (the measure of energy that a radiation beam releases as it travels through air). An ARPANSA staff member also spent a week working in the BIPM Laboratory, which maintains the ionising radiation standards against which every country's standards (including Australia's) are compared. The ionising radiation standards maintained at the BIPM are the standards against which the ARPANSA standards and every other countries standards in the world are compared. This time enabled valuable discussions on the standards and workings of other similar national laboratories around the world. The IDOS Symposium 2019 is the premier meeting for medical radiation dosimetry and the standards which underpin radiation therapy protocols. ARPANSA delivered a presentation on the valuable contribution of ARPANSA to a new IAEA protocol which will soon be the basis for radiotherapy treatments in Australia. This travel was funded by ARPANSA.

66th Annual Session of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), 10–14 June 2019, Vienna, Austria

The Deputy CEO of ARPANSA is the Australian Representative to UNSCEAR and now the Committee's Chair. UNSCEAR undertakes scientific assessments of radioactive sources and the effects of ionising radiation, including health risks to people and the environment. UNSCEAR reports its findings directly to the UN General Assembly. During the meeting, two documents, (i) Evaluation of selected health effects and inference of risk due to radiation exposure; and (ii) Lung cancer from exposure to radon, were reviewed and approved for publication as Annexes A and B of the UNSCEAR 2019 Report. The Committee also reviewed progress with its current program of work. UNSCEAR will continue work on a number of projects, including the update on the Fukushima accident, and finalising the surveys on medical exposures and occupational exposures to radiation. ARPANSA representatives have been primary contributors to all of these projects and will continue to provide data and support to these projects. The Committee also agreed on its future work program for 2020–24. This travel was funded by UNSCEAR and ARPANSA.

Integrated Regulatory Review Service mission to Norway, 17–28 June 2019, Oslo, Norway

ARPANSA participated in this IAEA-coordinated mission which performed a peer review of Norway´s national regulatory framework for nuclear, radiation, radioactive waste and transport safety. The Director for Radioactive Materials, Swedish Radiation Safety Authority, led this review team which involved 16 international experts and three IAEA staff. The review compared Norway´s regulatory framework for safety against IAEA safety standards as the international benchmark for safety. The mission was also used to exchange information and experience between the team members and Norwegian counterparts. In addition to the regulatory body, discussions were held with representatives of the three government ministries with regulatory responsibilities and functions. IAEA review missions of this nature are an integral component of the international safety regime. This travel was jointly funded by the IAEA and Norway.

47th Meeting of the IAEA Waste Safety Standard Committee (WASSC), 18–20 June 2019, Vienna, Austria

ARPANSA attended this meeting which focussed on the development and publication of safety guides, and strategic issues. These safety standards are used for regulatory management of radioactive waste in Australia and are incorporated into ARPANSA's Radiation Protection Series (RPS). A review of the existing RPS documents in light of these safety standards will strengthen the national uniformity of the regulatory framework across Australian jurisdictions. The strategic work priorities of WASSC complement and support ARPANSA's work program in developing and applying radioactive waste safety standards as part of a national uniformity program, especially for the safe management of radioactive waste in Australia.

ARPANSA's presentation on the application of IAEA Safety Standards to the Australian regulatory system was well received. Attendance to this meeting was funded by ARPANSA.

Technical Meeting for the National Coordinators of the Incident Reporting System for Research Reactors (IRSRR), 24–28 June 2019, Vienna Austria

ARPANSA participated in this IAEA technical meeting which discussed and presented nuclear research reactor events that have occurred over the last two years, their causes and contributors, as well as lessons learned from the events. The objective of the IRSRR is to improve the safety of research reactors worldwide through the exchange of operating experience. ARPANSA's participation provided an overview of other operator/regulator operating experiences among participants. ARPANSA also gains first-hand information on recent developments with regard to research reactor operations and regulation directly from member states, European Commission Joint Research Centre, and the IAEA. This travel was funded by ARPANSA.

Comprehensive Nuclear Test Ban Treaty (CTBT) Science and Technology Conference, and 8th Meeting of the Emergency Preparedness and Response Standards Committee (EPReSC), June 24–28 2019, Vienna, Austria

ARPANSA attended the CTBT conference which included 1700 scientists, technologists, academics, students, policy makers, members of the media and representatives of organisations involved in research and development that is relevant to all aspects of Treaty verification. Key outcomes included the display of technologies, sharing of innovative uses of data and analysis techniques, and reaffirmation of the CTBTO's aims for the treaty to enter into force. ARPANSA also attended the IAEA's EPReSC meeting which considered IAEA documents for review which could help inform fact-sheets for Australian first-responders, as well as upcoming research projects on the use of atmospheric dispersion models in emergencies and emergency communication in a misinformation-rich environment. This travel was funded by ARPANSA.

46th Meeting of the IAEA Radiation Safety Standards Committee (RASSC), 24–26 June 2019, Vienna, Austria

ARPANSA attended this meeting which allows Australia to contribute to, and influence, the development of IAEA safety standards for radiation protection. This aids the efficient implementation of international best practice in Australia. The meeting discussed the need to review the IAEA Safety Fundamentals (SF-1); updates on the development of IAEA safety reports and guidance documents (such as on protecting workers exposed to radon); a proposal for an IAEA technical document on the Application of the Graded Approach in Regulating Radiation Sources Facilities and Activities; and organising work for the IAEA International Conference on Radiation Safety in November 2020. This travel was funded by ARPANSA.

Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA) Nuclear Law Committee (NLC) meetings and associated working parties, 25–28 June 2019, Paris, France

ARPANSA's General Counsel participated in the OECD Nuclear Energy Agency's Nuclear Law Committee along with associated working party meetings. Key topics for discussion included legal aspects of nuclear safety, public participation in nuclear related activities, rules applicable to nuclear transport and transit, legal aspects of licensing small modular reactors, legal challenges to licensing decisions, and the enforcement of nuclear safety related laws and regulations. Participation enables ARPANSA to understand current thinking on these issues and influence future development of international nuclear law. This is

particularly relevant given the current debate in Australia around nuclear power. This travel was funded by ARPANSA.

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

ARPANSA categorises breaches of licence conditions based on whether the implications for safety (the potential risks to safety) were either significant or minor.

Breaches with significant safety implications typically occur where there is an unacceptable risk of potential radiation exposure to a person (such as an employee).

Breaches with minor or no significant safety implications are typically administrative failures to meet regulatory requirements, for example: failing to label equipment properly, submit paperwork on time, complete scheduled training, keep up-to-date inventories, or conduct scheduled reviews of planning documents. As a matter of policy, ARPANSA does not publicly name entities in the quarterly report for minor breaches.

Five breaches, determined in the quarter were considered to have minor or no significant safety implications. The breaches were for failing to comply with Licence conditions under the Australian Radiation Protection and Nuclear Safety Regulations 2018. These breaches were:

- one breach was for failing to tell the CEO of APRANSA about changes under section 64 of the Regulations
- one breach related to not complying with a relevant code or standard, specifically RPS 10 the Code of Practice and Safety Guide for Radiation Protection in Dentistry (2005)
- one breach was for failing to notify ARPANSA about a source transfer within seven days
- two breaches involved operating a source without licence or exemption.

One breach was identified with significant safety implications this quarter. This breach was at ANSTO's Little Forest Legacy Site whereby a helicopter, as a result of an incident during a planned exercise, made an

emergency landing inside the Little Forest Legacy Site (LFLS). This exercise did not go through the relevant approval and review processes, including submission to ARPANSA under section 63 of the Regulations.

Facilities licensed under Part 5 of the ARPANS Act

No new 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 (the Council) did not meet during the quarter.

The minutes of past meetings are on ARPANSA's website at www.arpansa.gov.au/rhsac. The next meeting is scheduled for 1–2 August 2019 in Sydney.

Reports to the CEO from the Council 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 meet during the quarter. Further information can be found in the meeting minutes which are provided online at www.arpansa.gov.au/rhc. The next RHC meeting will take place on 2–3 July 2019.

Nuclear Safety Committee

The Nuclear Safety Committee (NSC) met on 21 June 2019. The committee was updated on the regulatory activity of ARPANSA and major controlled facilities. The Committee provided comments to facilitate review of the ANSTO Health independent review action plan, and strategies such as the use of licence conditions to facilitate clear expectations as part of the approval of this plan.

The minutes of the meeting are provided online at www.arpansa.gov.au/nsc. The next meeting of the NSC is scheduled for 1 November 2019 in Sydney.

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.