



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

Quarterly Report

of the

Chief Executive Officer of ARPANSA

July to September 2015

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The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is the Australian Government's primary authority on radiation protection and nuclear safety. ARPANSA regulates Commonwealth entities using radiation with the objective of protecting people and the environment from the harmful effect of radiation. ARPANSA undertakes research, provides services, and promotes national uniformity and the implementation of international best practice across all jurisdictions.

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Letter of Transmittal

23 November 2015

Senator the Hon Fiona Nash
Minister for Rural Health
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 (the RHC)
- details of any direction given by the Minister to the CEO under section 16 of the Act
- any breach of licence conditions by a licensee, of which the CEO is aware
- 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
- the 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 July to 30 September 2015.

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

Report on the Operations of the CEO and ARPANSA

ARPANSA is an agency within the Department of Health portfolio focused on delivering the outcome and program described in its Portfolio Budget Statement.

Outcome for the Australian community:

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

To deliver this outcome, the agency undertakes a planned set of activities collectively referred to as the **Radiation Protection and Nuclear Safety Program**.

This program is made up of four components:

- protect the public, workers and the environment from radiation exposure
- promote radiological and nuclear safety and security, and emergency preparedness
- promote the effective use of ionising radiation in medicine, and
- ensure effective and proportionate regulation and enforcement activities.

The report on the operations of the CEO and ARPANSA is based on these components.

Protect the public, workers and the environment from radiation exposure

Uranium Mining and Naturally Occurring Radioactive Materials Industries

ARPANSA maintains the Australian National Radiation Dose Register (the Dose Register) which records, stores and audits radiological dose histories for uranium industry workers in Australia. The Dose Register is receiving worker dose records from all four uranium mines that are licensed to operate in Australia: Olympic Dam, Beverley and Honeymoon (presently in caretaker mode) in South Australia, and Ranger (not presently carrying out mining activities) in the Northern Territory. The Dose Register currently holds dose history records for more than 34,000 workers with more than 600,000 individual records from the uranium mining and milling industry. ARPANSA is continuing to work on its expansion to include occupationally exposed workers in other industries, such as mineral sands mining and processing operations, and applicable Commonwealth practices.

Monitor and Mitigate Population Exposures to Electric and Magnetic Fields and Electromagnetic Radiation

During this quarter, the Standards Australia Committee TE-007 – Human Exposure to Electromagnetic Fields, chaired by ARPANSA, concluded its revision of the joint Australian and New Zealand Standard AS/NZS 2772.2 *Radiofrequency fields – Part 2: Principles and methods of measurement and computation – 3 kHz to 300 GHz* with public consultation on the draft standard commencing on 27 August 2015.

ARPANSA also proposed an amendment to Schedule 5 of Radiation Protection Series No. 3 *Maximum exposure levels to radiofrequency fields – 3 kHz to 300 GHz* to address inconsistencies in compliance testing of portable radiofrequency transmitting equipment. The details of this proposal were provided in an out-of-session paper to the Radiation Health Committee.

ARPANSA published an analysis of Electromagnetic Radiation (EMR) Health Complaints Register Data for 2014-2015. The Register collects reports of health concerns related to possible EMR field exposures in the range of 0-300 GHz. Members of the public who believe they have suffered ill-effects as a result of exposure to EMR can lodge a written complaint to the Register (www.arpansa.gov.au/pubs/emr/analysis14-15.pdf).

ARPANSA revised its advice on exposure limits to extremely low frequency (ELF) electric and magnetic fields by referring to the International Commission on Non-Ionizing Radiation Protection (2010) ELF Guidelines (see www.arpansa.gov.au/Regulation/ibp/nonionisingsafety.cfm#NI16).

On 28 July 2015 the ARPANSA CEO, Dr Carl-Magnus Larsson met the CEO of the Australian Mobile Telecommunications Association, Mr Chris Althaus (www.arpansa.gov.au/pubs/aboutus/amta/amta-arpansa_280715.pdf).

ARPANSA provided a report on Australian activities related to EMR for a meeting of the New Zealand Interagency Committee on Non-Ionising Fields held on 12 August 2015 in Wellington, New Zealand (www.health.govt.nz/our-work/radiation-safety/non-ionising-radiation/research-non-ionising-radiation).

On 23 September 2015, ARPANSA staff met with a representative from the Japan Electromagnetic Fields Information Center to exchange information on how Australia and Japan deal with EMR issues.

Solar Ultra Violet Radiation and Sun Protection

Currently ARPANSA measures solar ultraviolet radiation (UVR) at eleven sites around Australia and the Ultraviolet (UV) Index data generated by the network is used to raise awareness in the Australian population of the levels of UVR and the health risks associated with excessive sun exposure. During this quarter, ARPANSA installed additional data logging and UV detectors at Perth airport as part of a continuing program to improve the measurement network.

On 7 September, ARPANSA attended a Standards Australia Meeting in Sydney for the Sun Protective Clothing Standard TX21 (AS/NZS 4399). The main reason for the meeting was for the TX21 committee to respond and resolve the public comments on the draft standard. A number of suggestions were adopted, resulting in modifications to the draft, including some additional explanatory figures.

Promote radiological and nuclear safety and security, and emergency preparedness

In July 2015, ARPANSA participated in Exercise CURIEosity which was coordinated by the Office of Health Protection, Department of Health and was undertaken to test the Health Chemical, Biological, Radiological & Nuclear Incident Plan. ARPANSA also played a leading role in the Visiting Ship Panel

(Nuclear) biennial seminar which was focused on the review and update of the plans and arrangements in place to support visits from nuclear powered vessels to Australian ports.

ARPANSA participated in an International Atomic Energy Agency (IAEA) international Convex-1a exercise and an IAEA international Convex-2b exercise to test the coordination and communication of information and requests for advice and assistance for hypothetical nuclear emergency situations. Participation in these exercises also serves to test components of ARPANSA's Emergency Preparedness and Response (EPR) plans.

ARPANSA completed the required analyses for the 2015 program of the IAEA Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) Proficiency Test. Samples of water, rice and soil were analysed for anthropogenic and naturally occurring radionuclides. ARPANSA also participated in an ALMERA regional group proficiency test for gross alpha/beta in filters, and anthropogenic radionuclides in soil.

International Monitoring Network

As part of Australia's ongoing commitment to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), ARPANSA operates and maintains radionuclide air particulate monitoring stations in Melbourne, Perth, Townsville, Darwin, the Cocos Islands, Macquarie Island, and Mawson Base (Antarctica), together with two noble gas monitoring facilities, co-located with the air particulate monitoring stations in Melbourne and Darwin.

During this quarter, ARPANSA continued to operate the Australian CTBT Radionuclide Laboratory which is a certified laboratory for analysis of air particulate samples and analysed five test samples.

Stakeholder engagement

ARPANSA led the redrafting work to update *AS/NZ 2243.4 Safety in Laboratories: Ionising Radiation*; working cooperatively with Standards Australia. The work is progressing satisfactorily and the group reviewed the preliminary draft of the standard and recommended a number of changes to the document. Agreement on the final version of the text is expected towards the end of the next quarter.

Promote the effective use of ionising radiation in medicine

Calibration Services

As a part of the agency's regular calibration services for radiotherapy providers and industry users of radiation, ARPANSA calibrated ten survey meters and the dosimeters for four hospitals. So far, ARPANSA's new calibration service in linear accelerator (linac) beams has been requested by approximately one third of hospitals seeking a radiotherapy calibration. Work continues to develop a calibration service for very small beams of radiation, in support of the increasing clinical use of small beams to treat cancer in Australia.

ARPANSA continued to collaborate with the Australian Synchrotron quantifying the radiation dose being delivered by the synchrotron's clinical beam line. Unique to synchrotrons, the micro-beams are tens of microns wide and have a dose rate 1000 times that of the conventional linear accelerators

used to treat cancer patients. ARPANSA and Synchrotron scientists measured the dose rate using several techniques including, in a world first, a graphite calorimeter in combination with a new beam delivery method. This ongoing collaboration is essential for the synchrotron to understand micro-beam dosimetry with the aim of treating cancer.

Australian Clinical Dosimetry Service

The Australian Clinical Dosimetry Service (ACDS) is a joint initiative between the Department of Health and ARPANSA to provide an integrated national approach to promoting safety and quality in radiotherapy. The ACDS provides radiation specialists with a source of independent audits for equipment and patient doses. The ACDS is continuing to advise improvements in radiotherapy treatment practice which improve patient outcomes. This quarter the ACDS finalised the re-staffing program and is training new staff to perform independently within all audit levels. During this quarter, the ACDS performed two Level I audits encompassing six linacs, three level Ib audits encompassing three linacs, three level II audits encompassing six linacs and four level III audits encompassing seven linacs.

Diagnostic Imaging

Liaison meetings are underway to establish national Diagnostic Reference Levels in Nuclear Medicine.

The Radiation Protection of the Patient software training module has been published and distributed to principle stakeholders for distribution and advertising. The final project report and financial acquittal has been submitted to Department of Health. Preliminary work on the next software training module for Radiation Protection of Medical Personnel has been initiated.

Stakeholder engagement

ARPANSA invited stakeholders to the first review assessment and formulation of computed tomography diagnostic reference levels which were originally published in 2012. Stakeholder meetings with private radiology facility medical physicists were also held to discuss development and adaption of the DRL website to better suite private radiology business practices.

Ensure effective and proportionate regulation and enforcement activities

In accordance with the Australian Government's Regulator Performance Framework, ARPANSA's Regulatory Services Branch has developed a set of specific regulatory performance indicators against which performance will be assessed. The first report is due to the Australian Government in 2016, after completion of a detailed self-assessment. The regulatory performance indicators are aligned with six key goals outlined in the Regulator Performance Framework (see www.cuttingredtape.gov.au), which are summarised below:

- Regulators do not unnecessarily impede the efficient operation of regulated entities
- Communication with regulated entities is clear, targeted and effective
- Actions undertaken by regulators are proportionate to the regulatory risk being managed
- Compliance and monitoring approaches are streamlined and coordinated

- Regulators are open and transparent in their dealings with regulated entities
- Regulators actively contribute to the continuous improvement of regulatory frameworks.

ARPANSA continues to participate actively in the Community of Practice of Commonwealth Regulators, a group established to share good regulatory practices.

Significant Licensing Activities

ARPANSA approved the construction of an item important for safety under Regulation 54 at Australian Nuclear Science and Technology Organisation (ANSTO) Nuclear Medicine Molybdenum-99 Facility, which is currently under construction.

Per Regulation 51, ARPANSA approved installation, hot commissioning and operation of interlocks for high activity handling hot cells at an ANSTO Waste Operations facility.

ARPANSA approved installation and commissioning of the stack and the ventilation system at ANSTO Waste Operations intermediate level solid waste facility under Regulation 51.

Inspections

During the quarter, ARPANSA completed 16 inspections in accordance with its Regulatory Services Delivery Model. Inspection reports are posted on the ARPANSA website at:

www.arpansa.gov.au/regulation/inspections

No non-compliances were found during the quarter, although 37 performance deficiencies were identified. These deficiencies were provided to the licensee in support of continuous improvement. Inspection outcomes are reviewed and trended to inform the future program.

International Engagement

39th meeting of the IAEA Waste Safety Standards Committee and Joint Meeting of Nuclear Safety Standards Meeting and Waste Safety Standards Committee, 29 June to 3 July 2015, Vienna, Austria

From 29 June to 3 July, ARPANSA, as Australia's representative, chaired the 39th meeting of the IAEA Waste Safety Standards Meeting (WASSC) and attended the joint meeting of the Nuclear Safety Standards Committee Meeting (NUSSC). The Joint Meeting between NUSSC and WASSC summarised the IAEA's work in nuclear, radiation and waste safety including the decision to establish the new Emergency Preparedness and Response Standards Committee (EPreSC). New safety standards and guides were submitted for approval. This travel was funded by the IAEA and ARPANSA.

International Atomic Energy Agency Basic Safety Standard Medical Safety Guide Drafting Meeting, 6 to 10 July 2015, Vienna, Austria

From 6 to 10 July, ARPANSA attended the IAEA Basic Safety Standard Medical Safety Guide Drafting Meeting to review the new IAEA Draft Safety Guide DS 399 which accompanies the new Basic Safety Standards, GSR 3. It is expected that both GSR 3 and DS 399 will be incorporated into ARPANSA's regulatory Codes of Practice (RPS 14) and Safety Guides for the safe use of ionising radiation in medicine. This travel was part-funded by the IAEA.

57th Annual Meeting and Exhibition of the American Association of Physicists in Medicine, Anaheim, USA, 12 to 16 July 2015

From 12 to 16 July, ARPANSA attended the 57th Annual Scientific Meeting of the American Association of Physicists and presented posters on PhD research on neutron contamination in high energy radiotherapy and ACDS audit outcomes. Presentations were given that considered the ongoing area of uncertainty in radiotherapy. Attendance at this event will assist ARPANSA in developing its small field dosimetry program and the ACDS national dosimetric audit development. This travel was fully funded by ARPANSA.

New Zealand Institute of Medical Radiation Technology/Australian Institute of Radiography Scientific Meeting Wellington, New Zealand 24 to 26 July 2015

From 24 to 26 July, ARPANSA attended a joint meeting of the New Zealand Institute of Medical Radiation Technology and the Australian Institute of Radiography (AIR). The conference themed 'The Cloud: Shaping our future', was evenly divided between medical imaging and radiation therapy, with common sessions devoted to the profession, research and shaping the future. The AIR is a key stakeholder for both the ACDS and ARPANSA representing over 2000 workers in the clinical radiation space. The forum enables extensive opportunities, formal and informal, for user-feedback into the ACDS specifically and ARPANSA generally. This travel was fully funded by ARPANSA.

Technical Meeting for the Incident and Trafficking Database; and Consultancy Meeting to Review Draft Guidance on the Management of Disused Sources; and Discussions on the IAEA Regulatory Authority Information System (RAIS), Vienna, Austria, 27 to 31 July 2015

From 27 to 31 July, ARPANSA attended the Technical Meeting for the Incident and Trafficking Database (ITDB) and a Review Meeting on Disused Sources held in Vienna, Austria. ARPANSA's lead agency role as Point of Contact for the ITDB supports both Australia's international policy commitment to combat illicit trafficking in radioactive sources and materials; and ARPANSA's objective of protecting the public from the potential health and environmental risks associated with radioactive material that has fallen out of regulatory control. ARPANSA stands to gain a direct regulatory benefit from its participation in both meetings as this draft Guidance is intended to supplement the Code of Conduct on the Safety and Security of Radioactive Sources. This travel was principally funded by ARPANSA.

45th Session of the Comprehensive Test Ban Treaty Organization (CTBTO) Working Group B, 25 August to 3 September 2015, Vienna, Austria

On 3 September, ARPANSA attended the 45th session of the Working Group B held in Vienna, Austria as part of the Australian delegation (which included representatives from the Australian Safeguards and Non-proliferation Office (delegation lead) and Geoscience Australia). Working Group B brings together Member State representatives to discuss technical and operational issues related to the CTBTO's International Monitoring System (IMS). ARPANSA's participation supports Australia meeting its treaty obligations including the operation of atmospheric radionuclide measurement stations (seven particulate and two noble gas stations, and a radionuclide laboratory). ARPANSA is the third largest operator of radionuclide stations across the IMS. The meeting saw updates on topics including station performance, logistics, recapitalisation, and future developments and provided an opportunity to meet with other Member State representatives and discuss and share information on

operational issues. ARPANSA also had a number of meetings with CTBTO staff to discuss issues in real-time allowing for progress in both of our work programs. The travel was funded by ARPANSA.

IAEA International Conference on Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes: Programme Committee meeting, 1 to 4 September 2015, Vienna, Austria

From 1 to 4 September, ARPANSA attended the IAEA International Conference on Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes. Meeting participants discussed and refined programme topics, speakers and panel sessions for the International Conference on Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes to be held in Madrid, 23 to 27 May 2016. This travel was fully funded by the IAEA.

ARGOS Consortium Meeting, 7 to 11 September 2015, Copenhagen, Denmark

From 7 to 11 September, ARPANSA attended the annual Accident Reporting and Guidance Operating System (ARGOS) consortium meeting held in Copenhagen, Denmark. The meeting discussed the ten consortium member countries use of ARGOS over the past year, recent updates to the software and the project to modernise the software (ARGOS X). During this meeting ARPANSA also organised a workshop with consortium countries to discuss their use of ARGOS and response to Radiological/ Nuclear incidents. A workshop hosted by the Danish Meteorological Institute as part of the Nordic Nuclear Safety Research program was also attended. The workshop focused on the use of meteorological uncertainties in decision-making for nuclear emergencies. This travel was funded by ARPANSA.

IAEA Integrated Regulatory Review Service (IRRS) Mission Ireland, 30 August to 9 September 2015, Ireland

On 9 September, ARPANSA was part of a 14 member IRRS team of experts conducting a review of transport, control of medical exposures, occupational radiation protection, and control of chronic exposures (radon). Ireland also requested policy discussions in the areas of radioactive waste management and the integration of environmental protection into radiation regulation. ARPANSA's participation in this IRRS mission is in line with Australia's support for and contribution to the global nuclear safety regime. ARPANSA's contribution also enabled the sharing of knowledge and experiences in the areas of legislation and regulatory framework issues between ARPANSA and Irish regulatory counterparts. This travel was principally funded by the IAEA.

59th Session of the IAEA General Conference, 14 to 18 September 2015, Vienna, Austria

From 14 to 18 September, ARPANSA attended the 59th session of the IAEA General Conference in Vienna, Austria. ARPANSA's participation in the annual General Conference is a unique networking opportunity for nuclear regulators and policy makers in this space and ARPANSA attended various bilateral meetings with regulatory counterparts in other jurisdictions. ARPANSA coordinated input from Australia to the Safety Resolution following initial negotiations completed by the Australian Mission in Vienna. The Australian delegation comprised representatives from ARPANSA, the Australian Safeguards and Non-Proliferation Office, ANSTO, the Department of Environment and the Department of Foreign Affairs and Trade. The 59th session of the General Conference also marked the

launch of the IAEA Director General's Report on the Fukushima Daiichi Accident and ARPANSA led the working group who prepared Technical Volume 5 – Post-Accident Recovery. This travel was funded by ARPANSA.

Regional Cooperation on Emergency Preparedness and Response in South East Asia Workshop, 21 to 25 September, Chiang Mai, Thailand

From 21 to 25 September, ARPANSA attended a Regional Cooperation Workshop on EPR which focused on the technical aspects of data sharing and the use of decision support tools (ARGOS and RODOS). The European Commission, through the Joint Research Centre for transuranium elements, is currently undertaking a feasibility study in EPR for Radiological/Nuclear incidents in the South-East Asian (SEA) region which supports the sharing of data within these regions, and the use of decision support tools. The study is also looking at strengthening EPR capabilities among the SEA countries by developing a 'road map' for regional cooperation. ARPANSA was fully funded to attend this meeting to present on ARPANSA's experience using the ARGOS decision support system.

Details of any breach of licence conditions by a licensee

There were no breaches with safety implications recorded during the quarter.

Facilities licensed under Part 5 of the ARPANS Act

No new facilities were licensed during the quarter.

Transport of Radioactive Material

ARPANSA validated the certificate of a package design issued by the French Competent Authority for a B(U) Type Package for transporting the radioactive waste to be stored at the ANSTO Interim Waste Store .

Operations of the Radiation Health and Safety Advisory Council, the Radiation Health Committee and the Nuclear Safety Committee

Radiation Health and Safety Advisory Council

The Council met at Heidelberg Golf Club, Victoria on 2 to 3 July 2015. Members discussed Council's Strategic Directions for the next triennium and agreed on three priority areas. Members participated in a tour of ARPANSA laboratories including the CTBT radiation monitoring station, the Ultraviolet Protection Factor fabric testing laboratory, the linear accelerator and the anechoic chamber. The next meeting is scheduled for 5 to 6 November 2015 to be held in Sydney. The minutes will be available (after confirmation) at www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm. Reports to the CEO from the Radiation Health and Safety Advisory Council (s.20(f) of the Act)

There were no reports to the CEO from the Council during this quarter.

Radiation Health Committee

During this quarter, the RHC did not meet. The next meeting is scheduled for 18 November 2015.

Nuclear Safety Committee

During this quarter, the NSC did not meet. The next meeting is scheduled for 30 October 2015.

Details of Directions Given by the Minister

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

Radioactive Material Import Permits

The importation of radioactive material into Australia requires permission under Regulation 4R of the *Customs (Prohibited Imports) Regulations 1956*. These regulations are made under the *Customs Act 1901*. Under the *Customs (Prohibited Imports) Regulations 1956*, the Minister for Health may authorise ARPANSA officers to approve import permissions.

During this quarter, ARPANSA authorised officers issued 180 non-medical radioisotope permits including: 105 urgent permits, 67 standard permits and eight twelve month permits.

During this quarter, ARPANSA authorised officers issued 232 permits for medical radioisotopes including zero urgent permits, nine twelve-month permits and 223 single shipment permits for the months of July, August and September 2015.