



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**

Quarterly Report

of the

Chief Executive Officer of ARPANSA

October to December 2014

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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

6 March 2015

Senator the Hon Fiona Nash
Assistant Minister for 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
- 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 October 2014 to 31 December 2014.

Please note that Part 6, paragraph 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

As a portfolio Agency of the Department of Health, the following Portfolio Budget Statement outcome and delivery program identifies the results we intend to deliver to 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 on this outcome, we focus our activities into a **Radiation Protection and Nuclear Safety Program**.

This program is made up of four components to deliver our radiation protection and nuclear safety outcome and provide benefits and services to the Australian Government and community:

- 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 (ANRDR) which involves the collection, storage and auditing of radiological dose histories for uranium industry workers in Australia. The Dose Register has been successfully implemented to 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 in the Northern Territory. The Dose Register currently holds dose history records for more than 32,000 workers from the uranium mining and milling industry. ARPANSA is continuing to work on the expansion of the Dose Register to cover occupationally exposed workers in other industries, such as mineral sands mining and processing operations, and applicable Commonwealth practices.

During this quarter, ARPANSA hosted its third annual ANRDR Workshop as part of the Australasian Radiation Protection Society (ARPS) Conference in Hobart, Tasmania in October 2014. The purpose of the workshop was to engage with key stakeholders, updating them on the Dose Register's activities over the past year and to seek feedback on key issues such as data analysis, privacy legislation and national uniformity. Stakeholder feedback demonstrated overall support for the ANRDR. Workshop members provided discussion topics for next year's workshop, which included the promotion of national uniformity across mining operators in areas of dose assessment and analysis methodologies and the application of personal protective equipment. The Chair of ARPANSA's Radiation Health and Safety Advisory Council (RHSAC), Professor Ray Kemp, also contributed to the workshop, giving a presentation on the importance of uniformity and transparency for public trust and worker confidence.

Monitor and Mitigate Population Exposures to Electric and Magnetic Fields, Electromagnetic Radiation and Solar Ultra Violet Radiation

During this quarter, the Main Commission meeting of the International Commission on Non-Ionizing Radiation Protection (ICNIRP) was held in Australia at the University of Wollongong. At this forum, attended by senior ARPANSA scientific experts, international experts discussed the monitoring and mitigation of exposures to electric and magnetic fields (EMF), electromagnetic radiation (EMR) and solar ultra violet radiation (UVR) and potential health effects for the Australian public. On 11 November 2014, ARPANSA co-hosted a workshop with ICNIRP and the Australian Centre for Electromagnetic Bioeffects Research (ACEBR) on *Radiofrequency Field Health Effects and Standards*. The international workshop, held at the University of Wollongong, was open to members of the public and was aimed at discussing the latest evidence of health effects from exposure to radiofrequency (RF) fields and the implications to ICNIRP's current plan in updating their high frequency guidelines.

During the workshop, the CEO of ARPANSA presented ARPANSA's views on the health aspects of RF exposure and outlined ARPANSA's expectations of ICNIRP's development of updated guidelines. Dr Emilie van Deventer, Head of the World Health Organization (WHO) EMF Project, delivered an update on the preparation of the WHO RF Environmental Health Criteria (EHC), which is now out for public consultation. Four speakers from ICNIRP who specialise in epidemiology, animal experimentation studies, ICNIRP's philosophy in protection, and dosimetry, provided assessments of the adequacy of ICNIRP limits for protection against RF. In one presentation an alternative perspective called for a more lenient approach to limits. Following the presentations an extended panel discussion was conducted, covering the timeframe for the publication of RF EHC and whether Health Canada's more stringent limits will influence ICNIRP in updating the Guidelines. ICNIRP identified the need for an evidence-based approach when updating its Guidelines.

On 12 November 2014, ARPANSA staff attended the International Session of the ICNIRP Annual General Meeting at the University of Wollongong where there was discussion on the UVR protection campaign in Australia, as well as discussions between ARPANSA and ICNIRP on current non-ionising radiation protection efforts. The Session identified areas of closer cooperation between ARPANSA and ICNIRP.

Stakeholder engagement

Workshop on Protection of the Environment and ERICA tool – 26 October 2014

On 26 October 2014, as part of the ARPS conference ARPANSA co-hosted a workshop on *'Protection of the Environment and the ERICA Tool'*. The workshop provided training and advice on performing radiological assessments of the environment in order to demonstrate protection. The training included the use of ARPANSA's draft Safety Guide on *'Radiation Protection of the Environment'*, which was released for public comment in September 2014, as well as the use of the ERICA tool for undertaking this work.

ARPANSA and Minerals Council of Australia Annual Meeting – 26 October 2014

On 26 October 2014, the first annual meeting between ARPANSA and the Minerals Council of Australia (MCA) – Uranium Division (previously Australian Uranium Association) was held. The meeting was attended by the CEO of ARPANSA, key ARPANSA staff and the Executive Director of the MCA – Uranium Division. It provided an opportunity for discussion of key issues of mutual interest, including:

- status and update on the ANRDR, including future mineral sands participation
- proposed International Commission on Radiological Protection (ICRP) changes to dose conversion factors for radon decay products
- ICRP Main Commission Meeting in Sydney – April 2015
- introduction to Radiation Protection Series (RPS) publications
- development of the RPS Safety guide for radiation protection of the environment
- development of the RPS Safety guide for radiological clearance/closure criteria and management of contaminated sites, and
- an update on Fukushima nuclear power plant accident.

The 39th Annual Conference of the Australasian Radiation Protection Society, Hobart, Australia 26-29 October 2014

In October 2014, ARPANSA staff delivered a series of presentations at the *Australasian Radiation Protection Society* (ARPS) Conference covering the following topics:

- setting of limits for radionuclides in food
- application of new IAEA Basic Safety Standards for managing naturally occurring radioactive material (NORM)
- exposure to background radiation in Australia
- measuring radiofrequency radiation exposures in Melbourne
- exposures to ultraviolet radiation and improving sun protection for outdoor workers, and
- an overview of the dose assessment and health implications from the Fukushima Dai-Ichi accident.

ARPANSA's attendance at this conference provides an opportunity to network with other regulators, industry and researchers responsible for and involved in radiation protection in Australia and to publicise ARPANSA's work in promoting the protection of public, workers and environment from radiation exposures in everyday life.

Science and Wireless – 11 November 2014

On 11 November 2014, ARPANSA staff attended the annual *Science and Wireless* public event, hosted by the Australian Centre for Electromagnetic Bioeffects Research (ACEBR) with the theme of 'Living in a wireless world of mobile phone, base stations & Wi-Fi: Health & electro-hypersensitivity

(EHS)'. During the event, which is open to the public, some concerned community members expressed their opinion that EHS is caused by RF sources, however it was the consensus of the RF experts at the event that the attribution of EHS to RF exposure is not scientifically based.

Electromagnetic Energy Reference Group – 21 November 2014

The Electromagnetic Energy Reference Group (EMERG) comprises representatives from consumer organisations, the telecommunications industry, the health sector, academic organisations, other government organisations and community groups and was established to provide the CEO of ARPANSA with stakeholder input into EME issues of community concern. On 21 November 2014, a meeting of EMERG (with a new group of members) was held at ARPANSA's Melbourne Offices focusing on stakeholder presentations on information and community expectations. More information on EMERG is available from www.arpansa.gov.au/AboutUs/Committees/emerg.cfm.

Apex Alpha Spectrometry Training Course – 2-5 December 2014

From 2-5 December 2014, ARPANSA co-hosted a training course in Canberra on alpha spectrometry. The course was attended by eighteen participants from Australia, New Zealand and Singapore, including six staff from ARPANSA. Three of the four days focused on the delivery of the training package for Canberra Apex Alpha software and one day of the workshop enabled participants to share experiences, challenges and successes in alpha spectrometry measurement techniques, to discuss and develop common approaches to alpha spectrometry, working towards a stronger Australian and regional network of laboratories.

ARPANSA and the Australian Communications and Media Authority meeting – 4 December 2014

On 4 December 2014, the CEO and Chairman of the Australian Communications and Media Authority (ACMA) and the CEO of ARPANSA met pursuant to the Memorandum of Understanding between the two agencies that was signed on 27 November 2007. During the meeting there was discussion on the shared need to clearly communicate correct information on EME regulatory and public health issues and the responsibilities of the various agencies and other parties.

Australian Standards

ARPANSA continued to lead work on the update of the Australian Shade Cloth Standard (AS/NZS4174:1994). A draft revision of the standard was produced and sent to Standards Australia for formatting in December. The draft should be circulated to the committee for comment in January 2015.

Work has continued on the Australian Sun Protective Clothing Standard (AS/NZS 4399:1996) with ARPANSA staff participating in two working groups. Working Group 1 is reviewing the test methods for measuring fabric Ultraviolet Protection Factor and Working Group 2 is reviewing the body coverage requirements for sun protective clothing, with the aim of ensuring that garments qualifying to be sun protective must have sleeves and cover a reasonable proportion of both arms and legs.

On 26 November and 9 December 2014, ARPANSA staff members participated in a teleconference meetings of Standards Australia Committee TE-007 – Human Exposure to Electromagnetic Fields. ARPANSA chairs this Committee, which oversees the update of relevant Australian Standards related

to exposure to electromagnetic fields. At these meetings, progress on the update of *Australian Standard 2772.2:2011 Radiofrequency fields – Principles and methods of measurement and computation – 3 kHz to 300 GHz* was discussed.

ARPANSA is leading the redrafting work to update *AS/NZ 2243.4 Safety in Laboratories: Ionising Radiation*. Following some delays in progress ARPANSA has worked cooperatively with Standards Australia to reform the working group. Following reformation of the working group by Standards Australia, ARPANSA chaired a meeting of the group by teleconference in December 2014. Progress is now being made and the group has agreed to provide the outstanding draft sections by the end of February.

Publications

Stark K, Andersson P, Beresford NA, Yankovic TL, Wood MD, Johansen MP, Vives I, Batlle J, Twining J, Keum D-K, Bollhöfer A, Doering C, Ryan B, Grzechnik M and Vandenhove H (2014). Predicting exposure of wildlife in radionuclide contaminated wetland ecosystems. *Environmental Pollution*, 196 (2015) 201-213.

Wong CC, Liu W, Gies P, Nixon RL (2014). Think UV, Not Heat! *Australasian Journal of Dermatology* doi: 10.1111/ajd.12272 First published online 12 Dec 2014.

Durvasula S, Gies P, Mason RS, Chen JS, Henderson S, Seibel MJ, Sambrook PN, March LM, Lord SR, Cok C, Macara M, Parmenter TP, Cameron ID (2014). Vitamin D response of older people in residential aged care to sunlight derived ultraviolet radiation. *Osteoporosis International*. 9:197.

Guo S, Gies P, King K, Lucas R (2014). Vitamin D and acculturation in cardio-metabolic health: A community-based study of East Asian Australians living in Canberra, Australia. *Photochem Photobiol*. 90; 1455-1461.

Promote radiological and nuclear safety and security, and emergency preparedness

During this quarter, ARPANSA maintained specialised radiation emergency capabilities in line with Australian emergency planning arrangements. ARPANSA's Emergency Preparedness and Response Group continued its training cycle by providing emergency response training to ARPANSA staff.

ARPANSA and the Attorney General's Department Protective Security Training College co-hosted a graduation ceremony for the initial pool of accredited radiation security advisors as part of the National Radiation Security Advisor Accreditation Scheme (NRSAAS). Completion of this training means that states and territories now have access to qualified and accredited experts to assist with the formulation and endorsement of security plans for the use of radioactive materials and associated facilities. The NRSAAS was developed and supported by the Radiation Health Committee and represents an example of ARPANSA working with the jurisdictions to achieve national uniformity within Australia.

On 22-23 October 2014, ARPANSA staff participated in a two-day workshop to review the current emergency preparedness plans and arrangements for Nuclear Powered Vessel (NPV) visits to Australia. These visits are coordinated across Commonwealth, State and Territory organisations. An Australian Government interdepartmental committee, the Visiting Ships Panel (Nuclear) (VSP(N)) is responsible for maintaining the Australian Defence Organisation manual - OPSMAN1 that details these arrangements. The workshop was hosted by Navy and led by Rear Admiral Michael Uzzell, the Head Navy Engineering and the chair of the VSP(N). The workshop focused on the development of a Functional Model to map the roles and functions of the VSP(N) and the associated emergency preparedness and response arrangements at the national and regional level. The workshop included participants from ARPANSA, the Australian Defence Organisation, Emergency Management Australia, the Commonwealth Department of Health and Queensland Health. The review of these plans and arrangements will continue through 2015.

International Monitoring Network

As part of Australia's commitment to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), ARPANSA continues to operate and maintain radionuclide air particulate monitoring stations at 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, as part of the CTBT laboratory network, ARPANSA continued to operate the Australian CTBT Radionuclide Laboratory (CRL) which is a certified laboratory for analysis of air particulate samples. Six samples were analysed during the quarter as part of an international programme of proficiency testing. The ARPANSA CRL received the highest grade for their provisional results in the previous quarter for the annual proficiency test exercise conducted by the CTBTO. ARPANSA has commenced preparation for a CRL Workshop, hosted in cooperation with the CTBTO, to be held in Melbourne from 16-20 February 2015. These workshops are held about every two years and will bring together approximately 50 managers and operators from the international CRL network of sixteen laboratories and the CTBTO.

Promote the effective use of ionising radiation in medicine

Calibration Services

As a part of ARPANSA's regular calibration services for radiotherapy providers and industry users of radiation, eight survey meters, five personal dosimeters, seven electrometers and seven ionisation chambers were calibrated. The first calibrations for megavoltage linac photons were commenced. This is a new service started in 2014 in which detectors used for determining radiotherapy doses are calibrated on a linear accelerator (linac).

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, which is expected to lead to further improvements in radiotherapy treatment outcomes. The ACDS provides radiation specialists with a source of independent checks for equipment and patient doses.

In August 2014, ministerial approval for funding for the ACDS was obtained with agreement that the service would transition to an ongoing user-supported model within two years. A new Memorandum of Understanding (MoU), describing the work program being funded was signed by the Delegates in late December and the process for hiring of new expert staff is ongoing. During this quarter the ACDS maintained the existing audit service and continued the planning process for the 2015-16 program.

Diagnostic Imaging

A management group was initiated to develop the harmonisation of *RPS 14, Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (2008)* with the IAEA General Safety Requirements Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards.

A draft training module, titled 'Radiation Protection of the Patient – Improved Safety and Quality of Diagnostic Imaging in Australia', for referring clinicians was completed.

Staff attended the Department of Health Diagnostic Imaging Advisory Committee (DIAC) to discuss proposed amendments to the Diagnostic Imaging Accreditation Scheme (DIAS) facility compliance requirements.

Publications

Thomas PT, Hayton A, Beveridge T, Marks P, Wallace A, National Diagnostic Reference Level Service data 2011-2013 and Dose Saving in CT, *Spectrum*, V21(10), Nov 2014.

Lye J, Kenny J, Lehmann J, Dunn L, Kron T, Alves A, Cole A and Williams I. 'A 2D ion chamber array audit of wedged and asymmetric fields in an inhomogeneous lung phantom' *Med. Phys.* 41, 101712 (2014); <http://dx.doi.org/10.1118/1.4896097>.

Stakeholder engagement

From 26 to 29 October 2014, ARPANSA attended the Australasian Radiation Protection Society's (ARPS) annual meeting. The ARPS conference is a key meeting for engagement with radiation protection professionals on new and emerging risks and progress reporting on ARPANSA initiatives including the ACDS, the National Diagnostic Reference Level Service and educational work on Radiation Protection of the Patient.

From 7 to 9 November 2014, ARPANSA staff helped organise and attended a Summer School for medical physics trainees and which included lectures and debates at the Epworth Hospital in Richmond as well as practical exercises and hands-on theory activities. The event was fully subscribed with 67 registrations. There were two international speakers and a number of local experts, including ARPANSA medical radiation scientists. The school covered many aspects of radiation protection in both diagnostic imaging and radiotherapy starting with international approaches to radiation protection to more specific consideration of state regulations and practical hands-on problem solving activities.

From 21 to 22 November 2014, ARPANSA staff attended the Australian Synchrotron Users Meeting delivering three presentations concerning the measurement of synchrotron radiation for medical uses.

Ensure effective and proportionate regulation and enforcement activities

The main vehicle for the promotion of national uniformity of radiation protection throughout the jurisdictions is the *National Directory for Radiation Protection* (the National Directory or NDRP) which is jointly developed by ARPANSA with the state and territory jurisdictions through the Radiation Health Committee (RHC).

The aim of the National Directory is to provide nationally uniform requirements for the protection of people and the environment against exposure or potential exposure to ionising and non-ionising radiation and for the safety and security of radiation sources, including provision for the national adoption of codes and standards. The National Directory addresses the needs of radiation protection regulators but also benefits other sectors involved in implementing radiation controls, such as mining and occupational health and safety regulators.

At its November 2014 meeting, the Radiation Health Committee noted the outcomes of discussions with the Office of Best Practice Regulation (OBPR) regarding proposed amendments to the National Directory and approved a preliminary re-drafting of the NDRP to, inter alia, import the requirements of the IAEA's GSR 1 into the NDRP as principles, accommodate impending publication of the ARPANSA Planned Exposure Code and make other editorial changes.

The Committee agreed to remove Annex 2 in all RPS publications, to be replaced by a reference to the *Fundamentals for Protection against Ionising Radiation RPS F-1*.

The Committee noted the progress on the development of Schedule 14 of the NDRP which provides guidance on disposal of radioactive waste by the user. The responsible project manager informed the Committee that eight comments were received on the draft during the consultation stage, and considered. The Committee voted on the revised wording of the NDRP amendment and approved its progress to Australian Health Ministers Advisory Council.

Standards and Guides

In December 2014, ARPANSA published the *Code for the Safe Transport of Radioactive Material, RPS C-2* (commonly referred to as the Transport Code) which replaces the *Code of Practice for the Safe Transport of Radioactive Material (2008) (RPS 2)*. It adopts the International Atomic Energy Agency Regulations for the Safe Transport of Radioactive Material 2012 Edition (No. SSR-6). This Code is intended to establish uniform requirements for the transport of radioactive material in Australia by road, rail or those waterways not covered by the Maritime legislation.

Significant Licensing Activities

In October 2014, regulatory review of the OPAL reactor Periodic Safety Review (PSR) was finalised. The ANSTO's safety assessment provided assurance that the facility has been designed and is operating safely and adequately conforms to the current safety standards and practices. It has also shown that there are plans and arrangements in place for its continued safe operation until the next Periodic Safety Review scheduled for November 2021.

In December 2014, in relation to the finalised review of the OPAL PSR, ARPANSA revisited ANSTO's compliance with special licence conditions issued by ARPANSA in 2008. The special licence conditions were based on the OPAL reactor fuel modification that arose from the 'fuel fault' event dated in July 2007. Evidence presented in the OPAL PSR together with the information previously provided by ANSTO showed the requirements of the special licence conditions have been met. Therefore, the licence conditions were removed.

On 1 October 2014, ARPANSA approved a request from ANSTO for inclusion of Yttrium-90 (Y-90) in the inventory of ANSTO Health Facility Licence F0262 under Regulation 51. As a consequence of this approval, Facility Licence F0262 was amended.

On 7 and 18 of November 2014, ARPANSA approved the construction of three items important for safety under Regulation 54 at ANSTO Nuclear Medicine Molybdenum-99 Facility, which is currently under construction (F0285).

In November 2014 ARPANSA participated in an international decommissioning workshop for the HIFAR reactor hosted by ANSTO at Lucas Heights. Presentations were given by two ARPANSA staff members on regulatory expectations and requirements for decommissioning.

Inspections

ARPANSA continued its licensee inspection program and undertook a series of 9 inspections and site visits during the quarter. Inspection reports are posted on ARPANSA's website at www.arpansa.gov.au/regulation/inspections/index.cfm.

Implementation of new Delivery Model

During this quarter, ARPANSA developed a 'Delivery Model' to improve regulatory effectiveness and efficiency through an increased use of risk-based oversight and risk-informed decision making. The delivery model describes how limited resources can be optimised whilst enhancing radiation and nuclear safety. It also details a rigorous approach to inspection. In December 2014, the ARPANSA's Regulatory Services Branch established a long-term inspection schedule for all licence holders which incorporates a risk-informed approach to inspections. This Delivery Model, which focuses upon regulatory inspection changes to how ARPANSA assures and secure operation by licensees, is planned to be implemented in January 2015.

ARPANSA plays an important role in managing risk and protecting the interests of the community. In addition to ensuring safety, properly administered regulatory frameworks can also improve efficiency for both ARPANSA and licensees. In Australia's Regulator Performance Framework of 2014, ARPANSA's delivery of regulatory services strives to:

- avoid unnecessary intervention in the operations of regulated entities
- communicate with regulated entities clearly and effectively
- take action proportionate to the regulatory risks being managed
- choose an approach to compliance and monitoring that is streamlined and coordinated
- remain open and transparent in dealings with regulated entities and the public, and
- perform frequent self-assessments in order to improve our delivery model.

International Engagement

Integration of Safety Culture into Regulatory Practices, Vienna, Austria, 6-8 October 2014

From 6 to 8 October 2014, ARPANSA attended a workshop titled '*Integration of Safety Culture into Regulatory Practices*' held in Vienna, Austria. This workshop incorporated lessons learnt from the 2011 Fukushima nuclear accident and identified improvements in regulatory actions, policies and processes for strengthening the effectiveness of regulatory bodies in regard to safety culture.

ARPANSA operates a program for the holistic assessment of licence-holders and reviews its own practices in the field of safety culture.

This travel was funded by ARPANSA.

Technical Meeting of INES National Officers, Vienna, Austria, 13-17 October 2014

From 13-17 October 2014, ARPANSA attended a technical meeting of International Nuclear and Radiological Event Scale (INES) National Officers, held in Vienna, Austria. Participating countries presented and discussed recent developments relating to the International Nuclear and Radiological Event Scale (INES). For Australia, the meeting highlighted areas for improvement, particularly further work in national uniformity of reporting and streamlining of information channels between regulatory bodies.

This travel was funded by ARPANSA.

Comprehensive Test Ban Treaty Organisation Technical Training Programme for Radionuclide Station Operators with ORTEC Equipment, Tennessee, United States, 5-7 November 2014

From 5 to 7 November 2014, ARPANSA attended a Technical Training Programme held in Knoxville, Tennessee, United States conducted by the Comprehensive Test Ban Treaty Organisation (CTBTO). ARPANSA's attendance ensures that the agency has trained staff capable of providing the level of support required by the CTBTO to operate and maintain Australia's radionuclide stations.

This travel was funded by the CTBTO and ARPANSA.

Communicating UNSCEAR's assessment of levels and effects of exposure after the 2011 nuclear accident in Japan and Meetings representing ARPANSA at Fukushima University and the National Institute of Radiological Sciences, Tokyo, Fukushima City and Chiba, Japan, 7-14 November 2014

Following the publication of the UNSCEAR Fukushima report, UNSCEAR has undertaken a program of 'outreach' to the public and other stakeholders in Japan to communicate the report findings.

From 7 to 14 November 2014, senior ARPANSA scientific staff participated in an outreach activity which included presentation and discussion at the Science Agora event in Tokyo; a seminar at the United Nations University in Tokyo; and a workshop at Fukushima University in Fukushima City. A number of other meetings were held with key Japanese agencies and officials during this week.

The outreach provided an insight into how the outcomes of the report have been received in Japan. It highlighted the importance of communication activities that could discuss and provide expert comment on more than just the doses and effects of radiation. Whilst these are important, the impact of the Fukushima accident on Japanese society is broader than simply concerns about health concerns from radiation exposure.

This travel was funded by ARPANSA.

29th meeting of the International Atomic Energy Agency (IAEA) Transport Safety Standards Committee (TRANSSC) – 10-13 November 2015

From 10-13 November 2014, ARPANSA attended the 29th Meeting of the IAEA Transport Safety Standards Committee (TRANSSC) held in Vienna, Austria. The meeting discussed issues related to the 2015 review cycle for IAEA Regulations for Safe Transport of Radioactive Material 2012 Edition, Specific Safety Requirements No. SSR-6. In December 2014, ARPANSA published its *Code of Practice for Safe Transport of Radioactive Material 2014, RPS C-2*, which incorporates this IAEA SSR-6.

The meeting also discussed the Guide on the 'Preparation of a safety Case for a Dual Purpose Cask for Storage and Transport of Spent Fuel', which is in the approval process for publication by the IAEA. Detailed discussion took place on the *Technical Guide, 'Package Design Safety Reports for the Transport of Radioactive Material'*. France and Australia prepared the first draft of this document. This guide will be published as a Safety Guide.

The Guide will be used in the assessment of the dual purpose cask to be used for storing reprocessed waste in ANSTO Interim Waste Store.

This travel was funded by ARPANSA.

***International Atomic Energy Agency (IAEA) – Integrated Regulatory Review Service Mission to French nuclear regulator, Autorité de Sûreté Nucléaire (ASN), Paris, France
17 - 28 November 2014***

ARPANSA participated in an IAEA Integrated Regulatory Review IRRS mission to the French nuclear regulator, Autorité de Sûreté Nucléaire (ASN), as part of an international team of 22 senior nuclear safety and radiation protection experts from 17 IAEA Member States which ran from 17 to 28 November 2014.

The IRRS mission covered all civilian nuclear and radiological facilities and activities (with the exception of security) regulated by the Republic of France. The review compared the French regulatory framework for safety against IAEA safety standards as the international benchmark for safety. The IRRS review team findings resulted in a series of recommendations, suggestions and good practice in radiation protection and nuclear safety.

Participation in the IRRS allowed ARPANSA to gain insight into the regulatory approach of a mature radiation and nuclear safety regulator, ASN. In addition, it has allowed ARPANSA to engage with international colleagues in a range of regulatory areas including:

- graded approach in authorisation, review and assessment, inspection and enforcement
- managing interfaces between nuclear safety and security
- minimising patient medical radiation exposures
- communication, consultation and transparency in regulatory activities.

This travel was funded by the IAEA.

37th Meeting of the IAEA Radiation Safety Standards Committee, Vienna, Austria 24-27 November 2014

ARPANSA participated in the 37th Meeting of the International Atomic Energy Agency (IAEA)'s Radiation Safety Standards Committee (RASSC), joint meetings held in Vienna, Austria from 24-27 November 2014.

A number of draft safety standards were considered, including *DS399 Draft Safety Guide: Radiation Safety in Medical Uses of Ionizing Radiation* for approval for submission for Member State comment.

A day was devoted to a topical session titled Radon Exposure in Homes: Should it be Regulated? The topical session included presentations from international organisations (UNSCEAR, ICRP, WHO, IAEA) and from selected Member States including Australia.

This travel was funded by ARPANSA.

International Atomic Energy Agency (IAEA) Waste Safety Standards Committee, Vienna, Austria 24-28 November 2014

Australia, represented by ARPANSA, chaired the 38th meeting of WASSC held at the IAEA's headquarters in Vienna, Austria from 24 to 28 November 2014. WASSC considered drafts safety guides approval by the Safety Standards Committees focusing particular attention on those documents where WASSC is the lead committee.

The joint meeting of the Nuclear Safety Standards Committee, the Radiation Safety Standards Committee and the Waste Safety Standards Committee was opened by the Deputy Director-General who summarised the Agency's work in nuclear, radiation and waste safety including the recent CSS meeting. ARPANSA's contribution to developing these key documents is a unique opportunity for Australia to assist in shaping international recognised safety standards applicable to Australia's uranium mining industry and waste remediation of legacy sites.

This travel was funded by ARPANSA.

***IAEA International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers – Gaps, Challenges and Developments. Vienna, Austria
1-5 December, 2014***

From 1-5 December 2014, ARPANSA attended the IAEA's International Conference on Occupational Radiation Protection in Vienna, Austria. 79 Member States participated in the conference with ARPANSA chairing the session on National Dose Registers. The conference concluded that '*protecting medical workers and those exposed to naturally occurring radiation, such as air crew and miners, is the next frontier in occupational radiation protection*'. The outcomes of the conference will be considered in planning ARPANSA's future work in this area.

This travel was funded by ARPANSA.

BAPETAN visit to ARPANSA – 8-12 December 2014

From 8-12 December 2014, ARPANSA hosted a visit from the Chief Information Officer from the Indonesian Nuclear Energy Regulatory Agency (BAPETEN). During this visit a range of topics were discussed with ARPANSA experts, including general communications issues, setting up of regulatory structures, regulation of naturally occurring radioactive materials (NORM), remediation of legacy sites, transport and atmospheric modelling and emergency preparedness and monitoring of radiation in the environment.

Australia-Indonesia Nuclear Forensics Knowledge Sharing Workshop, ANSTO, Lucas Heights, NSW – 10 December 2014

On 10 December 2014, an ARPANSA participated in the nuclear forensics knowledge sharing workshop, hosted by ANSTO. The workshop provided the opportunity for Australia and Indonesia to share information in general terms about the roles and responsibilities of each agency, the roles of each agency in a nuclear security event and the relationship and interactions with other agencies in a nuclear security event.

3rd ASEM Annual Meeting on Nuclear Safety, Yogyakarta, Indonesia, 4 – 6 November 2014

From 4 to 6 November 2014, ARPANSA attended the 3rd Asia-Europe Meeting (ASEM) Seminar on Nuclear Safety which was convened in Yogyakarta, Indonesia. The seminar was hosted by Indonesia and co-sponsored by China, France, India, Lithuania, Pakistan, Singapore, Spain and the European Union. The seminar included sessions on the importance of cooperation between neighbouring countries and internationally, effective communication with the public, adequacy of human resources for operators and regulatory bodies and plans for future regional exercises and events.

ARPANSA's participation at this forum is important to maintain Australia's visibility of nuclear safety in the region.

This travel was funded by ARPANSA.

IAEA (3rd and 4th) Consultancy Implementing Guide on the Security of Radioactive Material in use, storage and associated facilities, 25-29 August 2014

From 25 to 29 August, 2014 ARPANSA attended the IAEA's 3rd Consultancy Meeting to further develop the *Implementing Guide (IG) on the Security of Radioactive Material and associated facilities* (Nuclear Security Series No. 11), held in Vienna, Austria.

The IAEA NSS No.11 implementing guide has been the key document that ARPANSA has maintained consistency with through our implementation of the ARPANSA RPS No.11 Code of Practice on the Security of Radioactive Sources. Being involved in shaping the way in which future revisions are developed allows ARPANSA's extensive operational experience in this field to be considered and captured. This will greatly assist Australia's adoption of the revised NSS No.11 implementing guide and ensure that we are implementing International Best Practice.

This travel was funded by the IAEA and ARPANSA.

IAEA Consultancy, Safety Guide: Radiation Safety of X-ray Generators and Radiation Sources Used for Inspection Purposes and Non-Medical Imaging, Vienna, Austria 1-5 December 2014

Between 1 to 5 December 2014, ARPANSA attended an IAEA Consultancy on *Safety Guide: Radiation Safety of X-ray Generators and Radiation Sources Used for Inspection Purposes and Non-Medical Imaging*, held in Vienna, Austria.

Over the past decade, there has been a large increase in the use of inspection imaging devices to screen postal items, baggage and cargo to detect concealed objects either within cargo or vehicles, or on or within the human body. However, there is currently no IAEA Safety Guide addressing the safety of radiation sources used for inspection purposes, or on the protection of workers and the public from exposure due to such devices and due to non-medical imaging procedures.

Involvement in the development of IAEA publications from the drafting stage helps ensure that the publications are appropriate and readily applicable for use in Australia.

This travel was funded by the IAEA and ARPANSA.

Details of any Breach of Licence Conditions by a Licensee

Incident

In December 2014, a facility licence holder informed ARPANSA of an incident involving improper access to a high radiation area. Although the actual radiation dose received by the worker was insignificant, the incident appears to involve programmatic deficiencies and personnel errors. A full analysis of this event by the licensee is ongoing in an effort to prevent recurrence. This unplanned incident did not result in injury, but it appears to have had the potential to do so (a 'near miss'). Interim measures have been put in place at the facility to assure safety. Pending completion of the cause analysis, which is expected to recommend several permanent corrective actions, ARPANSA will be determining whether this incident resulted in any conditions being breached and this determination will be reported upon in the January to March 2015 Quarterly Report.

Breaches with Safety Implications

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

Breaches with No or Minor Safety Implications

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

Facilities Licensed Under Part 5 of the ARPANS Act

During this quarter, no new facility licences were issued.

Transport of Radioactive Material

ARPANSA approved the package design for a Type B (U) Package, Model 2100, and issued the following certificate of design approval to ANSTO:

- AUS/2014-56/B(U)-96

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

Radiation Health and Safety Advisory Council

During this quarter, the Radiation Health and Safety Advisory Council (Council) met at ARPANSA's Sydney offices in Miranda, New South Wales, on 13-14 November, 2014 at ARPANSA's Sydney offices in Miranda, New South Wales. A full summary of the meeting is available at:

www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm.

The Council was briefed on:

- community submissions on various issues including smart meters and Wi-Fi in schools
- proposed changes to the Rules and Procedures for ARPANSA's Council and Committees in order to highlight and clarify the role of the Member representing the interests of the general public
- ARPANSA's current activities in relation to non-ionising radiation research, services and advice, and on emerging issues in this area
- the outcome of an expert panel review of ARPANSA publication, Radiation Protection Series 3 (RPS3), which found that while RPS3 remains fit for purpose there are opportunities for improvement. Both the Radiation Health Committee and ARPANSA have committed to begin reviewing RPS3 in 2015
- Dr Emilie van Deventer from the World Health Organization (WHO) delivered a presentation on the role of the WHO in relation to both ionising and non-ionising radiation protection, specifically in shaping research agendas, setting norms and standards and monitoring health.
Dr van Deventer conveyed the WHO's appreciation of ARPANSA's work as a WHO Collaborating

Centre, raising the possibility of ARPANSA acting as a 'Radiation Champion' for the WHO and emphasising the need for WHO Member States to continue to highlight the importance of radiation as an ongoing health issue.

The CEO of ARPANSA also consulted with members on the proposed appointments to the Nuclear Safety Committee and Radiation Health Committee for the next triennium.

Members also discussed:

- the draft *IAEA Safety Guide DS460* which was recently released for Member State comment
- the draft statement on the Linear No Threshold (LNT) approach to regulation
- the precautionary approach in relation to radiation protection.

Members agreed that:

- further work is required to provide clarification of the Precautionary Approach
- the provisional agenda for Council meetings should be available to the public at least two weeks prior to meetings and that, subject to the Chair's approval, members of the public should not be restricted to commenting or presenting only on topics already included in the agenda.

Reports to the CEO from the Radiation Health and Safety Advisory Council (s.20(f) of the Act)

On 9 December 2014, the Council delivered an Annual Report of Council's activities from 1 July 2013 to 30 June 2014.

Radiation Health Committee

The Radiation Health Committee met on 19 November 2014, at ARPANSA's Miranda Offices.

This was the final meeting of the triennium, and announcements on Committee membership for the next triennium were sent in late December 2014.

The Member representing the Public Interest informed the Radiation Health Committee that no further nominations have been received for a site for the national radioactive waste management facility following the Northern Land Council's withdrawal of their nomination for Muckaty Station, and that it is now open for others to volunteer a site.

The Committee acknowledged the update of the *Radiation Protection Guide on Industrial Radiography*, agreeing to reference the *Planned Exposure Code* and *IAEA Specific Safety Guide SSG-11* for guidance in this area, with further work required on drafting the conditions of authorisation.

The Committee noted the revised web content and proposed stakeholder feedback form to appear on the National Uniformity page of the ARPANSA website, along with the Radiation Health Committee Position Statement on Regulatory Expectations, referencing those jurisdictions that supported the statement. The Committee also noted the further development of ARPANSA's

International Best Practice webpage which now provides links to the IAEA, ICRP, ICNIRP, WHO and UNSCEAR. The Member representing the Public Interest praised ARPANSA's webpage as a valuable source of international best practice guidance for members of the public.

The Committee was informed that the Australian Communications and Media Authority requested that Schedule 5 in RPS3 (Maximum Exposure Levels to RF fields) be amended to increase the frequency range in light of new technologies. A report on possible consequences is being prepared for their consideration.

The Radiation Health Committee noted the priorities for the development of the harmonised Radiation Protection Series which will form part of the Committee's work plan for the next triennium.

Nuclear Safety Committee

The Nuclear Safety Committee met on 31 October 2014. A full summary of the meeting is available at: www.arpansa.gov.au/AboutUs/Committees/nscmt.cfm.

The Committee provided advice on two matters pertaining to controlled facilities: the possess and control licence application ANSTO submitted to ARPANSA in relation to the Little Forest Legacy Site; and the change in arrangements to the Site Operations Safety Supervisors at the Lucas Heights Science and Technology Centre.

The Committee discussed an updated project plan to develop draft publications pertaining to nuclear safety and the safety of controlled facilities to better align the Radiation Protection Series publications to those of the IAEA Safety Standard Series.

The Committee reported on the international best practice approaches adopted by the UK's Office of Nuclear Regulation (ONR). Members discussed the similarities and differences between ARPANSA and the ONR in relation to safety requirements, standards and oversight of controlled facilities.

The Committee considered regulatory performance frameworks for controlled facilities and the recently published Regulator Performance Framework. Members discussed the benefits and detriments of various indicators that can be used to assess regulator performance.

The Committee reviewed the work undertaken during the 2012-2014 triennium for the purpose of identifying areas of improvement and future business for the next triennium.

The Nuclear Safety Committee will next convene on 6 March 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 160 non-medical radioisotope permits including: 99 urgent permits, 67 standard permits and three twelve-month permits.

During this quarter, ARPANSA authorised officers issued 180 single shipment permits for medical radioisotopes. There were nil urgent permits and no twelve month permits. ARPANSA has stopped issuing urgent medical radioisotope permits.