Australian Government

Australian Radiation Protection and Nuclear Safety Agency

QUARTERLY REPORT

OF THE

CHIEF EXECUTIVE OFFICER

OF ARPANSA

FOR THE PERIOD 1 OCTOBER 2013 TO 31 DECEMBER 2013

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Further information about this publication

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

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Letter of Transmittal

3 February 2014

Senator the Hon Fiona Nash
Assistant Minister for Health
Parliament House
Canberra ACT 2600

Dear Minister

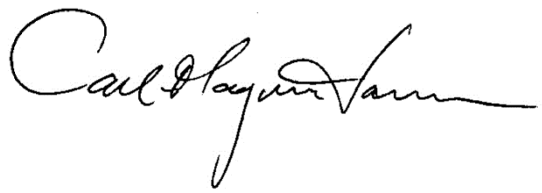
The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer (CEO) of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- 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 paragraph 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 2013 to 31 December 2013.

Please note that Section 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

The report on the operations of the CEO and ARPANSA is based on the key strategic directions:

- apply best practice regulation through the promotion of national uniformity and regulation
- promote the most effective use of radiation in therapeutic treatments and in diagnostic medicine
- improve radiation protection of workers, the public and the environment from natural sources including uranium mining and radioactive waste disposal
- assure the security of radioactive sources in Australia and strengthen Australia's capability to respond to radiation emergencies, and
- monitor and advise on population exposures to ultraviolet radiation, extremely low frequency electric and magnetic fields and electromagnetic radiation.

Regulate the Use of Radiation

National Uniformity

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) which is jointly developed by ARPANSA with the state and territory jurisdictions through the Radiation Health Committee.

During this quarter, the proposed sixth amendment of the National Directory (covering Schedules 5, 6, 9 and 13) was considered out of session by the Standing Council on Health (SCoH) following endorsement by the Australian Health Ministers' Advisory Council (AHMAC) in July. Support for this amendment was received from all jurisdictions except for Victoria which is yet to respond.

Agreement was reached that the proposed amendment for control of IPLs and lasers for cosmetic use proceed to a Consultation Regulatory Impact Statement. Work continued on other proposed amendments including the certification of personal radiation monitoring services and the disposal of radioactive material intended to replace the NHMRC *Code of practice for the disposal of radioactive waste by the user (1985).*

The Radiation Health Committee and the Radiation Health and Safety Advisory Council both unanimously endorsed the draft *Fundamentals: Protection against ionising radiation*, for publication in the Radiation Protections Series (see further under specific chapters for the Committee and Council activities in this report).

Significant Licensing Activities

During this quarter, ARPANSA issued the following new or amended facility licences:

- Nuclear installation licence (F0270) to prepare a site for the ANSTO Nuclear Medicine Molybdenum-99 facility at Lucas Heights Science and Technology Centre issued to ANSTO on 4 October 2013.

- Prescribed radiation facility licence (F0280) to operate the 1MV Compact Accelerator within the Centre for Accelerator Science at Lucas Heights Science and Technology Centre issued to ANSTO on 9 October 2013.
- Amended prescribed radiation facility licence issued to the Director of National Parks on 27 November 2013 establishing dose constraints for the South Alligator Disposal Facility.
- Nuclear installation licences to prepare a site (F0277) and to construct (F0279) the Interim Waste Store at Lucas Heights Science and Technology centre issued to ANSTO on 29 November 2013.
- Amended prescribed facility licence (F0271) issued to Synchrotron Light Source Australia Pty Ltd with revised licence conditions on 20 December 2013.

During this quarter ARPANSA received the following licence applications:

- Nuclear installation licence application (A0285) to construct ANSTO Nuclear Medicine Molybdenum-99 facility at Lucas Heights Science and Technology Centre
- Prescribed radiation facility licence application (A0287) to construct a 6 MV Tandem Accelerator for the Centre for Accelerator Science at Lucas Heights Science and Technology Centre.

These applications are currently under ARPANSA assessment.

Five breaches were recorded during the quarter, two with safety implications and three without. Aspects of these breaches are described later in this report.

On 16 November 2013, ARPANSA granted approval to ANSTO under Regulation 51 to make a change in shift roster at ANSTO Health.

On 12 December 2013, ARPANSA and ANSTO met to progress the OPAL Research Reactor Periodic Safety Review which is expected to be completed by the end of March 2014.

Inspections

ARPANSA continued its licensee inspection program and undertook 11 inspections and site visits during the quarter. The inspection and site visits were undertaken to monitor compliance with licence conditions, investigate operational incidents, and to gather information to progress current licence applications. Inspection reports are posted on ARPANSA's website at www.arpansa.gov.au/regulation/inspections/index.cfm

Promote the Effective Use of Radiation in Medicine

Radiotherapy

ARPANSA conducted a course on reference dosimetry (External Beam Reference Dosimetry Course, 10-11 October 2013, Lifehouse building, Camperdown, Sydney) in collaboration with the Royal Prince Alfred Hospital. The course was attended by 54 medical physicists and covered a range of topics including techniques and protocols for radiation measurement for all types of external beam radiotherapy. ARPANSA also made multiple presentations at the

annual conference of the Australasian College of Physical Scientists and Engineers in Medicine (ESPM 2013).

As a part of ARPANSA's regular calibration services for radiotherapy providers and industry users of radiation, four therapy dosimeters, ten radiation survey meters, three neutron monitors and nine personal dosimeters were calibrated. New calibrations services for megavoltage photons and electrons were implemented in this quarter and the first calibrations were performed as field trials for radiotherapy providers.

Australian Clinical Dosimetry Service

The Australian Clinical Dosimetry Service (ACDS) verifies the accuracy of radiation dose delivery from linacs in treatment centres to assure correct delivery of radiation dose to patients and it commenced auditing radiotherapy centres in 2011. The audits are conducted at a range of levels including: basic output audits of operational linacs (Level I); pre-operational audits of new linacs (Level Ib); audits of the whole radiation field using a two-dimensional detector array (Level II); and audits involving the pseudo-treatment of a simulated human torso made from tissue equivalent plastic which allows end-to-end audit of the treatment planning and delivery process (Level III).

The ACDS auditing requirements are mandated by a Memorandum of Understanding with the Department of Health. The ACDS has completed the required number of audits for all levels and thereby achieved or exceeded all of its agreed performance indicators.

During this quarter, the ACDS completed Level I audits on 11 linacs, Level II audits on 20 linacs, Level III audits on seven linacs and a Level Ib audit on four linacs. The Memorandum of Understanding with the Department of Health has been extended to continue operation of the ACDS through to June 2014.

Australian Diagnostic Reference Levels (DRL) for Medical Imaging

The computed tomography (CT) survey is ongoing with 779 compliant surveys submitted in 2013. In addition, approximately 25% of CT facilities have been registered for survey participation.

A large de-identified mammography patient dataset has been submitted from BreastScreen Victoria for the calculation of mammography Diagnostic Reference Levels (DRLs). A data analysis software suite is in development for this application.

The first draft nuclear medicine DRL survey has been distributed for national testing.

Existing modelling software, previously developed in-house, has been reviewed and adapted for contemporary computer platforms to calculate organ doses from various diagnostic imaging modalities.

Protect People from Natural Sources of Radiation

Exposures in Uranium Mining and Naturally Occurring Radioactive Materials (NORM) Industries

ARPANSA maintains the Australian National Radiation Dose Register (the Dose Register) which involves the collection, storage and auditing of radiological dose histories for uranium

industry workers in Australia. The Dose Register currently holds dose history records for more than 27,900 workers from the uranium mining and milling industry.

To ensure the Dose Register is consistent with international best practice of the more established international dose registers, ARPANSA is investigating the potential for its expansion to cover occupationally exposed workers in other industries.

During this quarter, ARPANSA has completed a review of the radiation dose record management practices in the mineral sands mining and processing industry. A draft report outlining the key findings and recommendations for expansion of the Dose Register into the mineral sands industry has been developed and circulated to industry for comment. The final report is expected to be published in the first quarter of 2014.

On 13 October 2013, the annual Dose Register Workshop was held in Cairns and was attended by key stakeholders, including representatives from the uranium and mineral sands mining industries, state and territory radiation and mining regulators, and Commonwealth licence holders. Presentations were made by ARPANSA staff and industry representatives. Material covered included the operational status of the Dose Register, analysis of data, national uniformity and best practice, and proposed expansion of the Register to other industries. The purpose of the workshop was to provide a platform for feedback from industry and facilitate a greater level of communication between ARPANSA and industry about the Dose Register work programs and plans for future development of the Register.

Measurement and Assessment

ARPANSA has provided ongoing advice to the Department of Environment on the Environmental Review and Management Plan (ERMP) submitted by Cameco Australia Pty Ltd under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to its proposed Kintyre Uranium Project, including an adequacy check of key areas.

Changes to recommendations made in 2011 by the International Commission for Radiological Protection (ICRP) on the calculation of radiation doses from the inhalation of radon and radon progeny had significant implications for assessing doses to uranium mine workers. In response, ARPANSA has formed a small group with representatives from the uranium mining industry, and state and territory regulatory authorities to coordinate an Australian response to these changes. In December 2013 the group commenced a program of measurements in the Olympic Dam uranium mine at Roxby Downs, South Australia, to characterise the radioactive aerosols in different work situations within Olympic Dam mine and it is anticipated that the results will be published in early 2014.

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

Electromagnetic Energy Reference Group

On 27 November 2013, a meeting of ARPANSA's Electromagnetic Energy Reference Group (EMERG) was held focusing on focused on the ARPANSA's review of the science on radiofrequency (RF) radiation and health, and considerations on future planning for updating the RF Standard. By way of background, EMERG was established to provide stakeholder and

community input into electromagnetic energy issues and the group includes representatives from consumer organisations, the telecommunications industry, the health sector, academic organisations, other government organisations and community groups.

Science and Wireless Symposium

On 27 November 2013, the newly formed Australian Centre for Electromagnetic Bioeffects Research hosted the public "Science and Wireless" symposium at RMIT University where ARPANSA's CEO officially opened the Centre delivering an opening address. The symposium provided an opportunity for scientists, regulators, industry specialists and members of the community to meet and exchange views on radiofrequency and health in a public forum. ARPANSA's Chief Radiation Health Scientist delivered a presentation at the symposium on public health aspects of new technologies.

LABCON Conference

On 3 December 2013, ARPANSA scientific officers delivered presentations on electromagnetic radiation (EMR) and ultraviolet (UV) radiation awareness and protection at the annual Laboratory Technicians Association of Victoria Conference held in Melbourne.

Analog and digital broadcast measurements

During this quarter, ARPANSA conducted a survey of RF measurements at over 40 sites across Melbourne, measuring the levels of RF produced by man-made sources, including mobile telephone, television and radio broadcast towers. The measurements were performed prior to the shutdown of analog broadcasting in Melbourne on 10 December 2013, to provide a baseline for comparison of future exposure levels.

Ultraviolet Radiation

Public Health England (PHE) and ARPANSA UV Intercomparison

In October-November 2013, ARPANSA hosted a scientist from Public Health England (PHE), for a two-week intercomparison of UV radiation measurement equipment, which will help provide uniformity and better advice to the Australian public.

Three Public Health England diode array UV spectrometers were compared against ARPANSA's UV spectral measurement system. The main Public Health England diode array UV spectrometer was also taken to the Bureau of Meteorology site at Broadmeadows to run alongside the Bureau's UV spectrometer which is supported and calibrated by the New Zealand National Institute for Water and Atmosphere.

All three spectral UV systems are traceable to different primary standards, as follows: ARPANSA uses the CSIRO National Measurement Institute; Public Health England uses the German Physikalisch-Technische Bundesanstalt standard; and both the Australian Bureau of Meteorology and the New Zealand National Institute for Water and Atmosphere rely upon the United States' National Institute Standards Technology (NIST) standard. The results of the intercomparison will provide more accurate and consistent measurements of ambient solar UVR for provision as UVR data to the general public. ARPANSA's UV measurements underpin the predictions made by the Bureau of Meteorology as well as its collaborations with the Cancer Councils, Sun Smart and others. Together with ARPANSA's public advice, this

forms a program to reduce the population's UV exposures to assist in minimising the skin cancer rates in Australia.

Meeting with World Health Organization (WHO) UV Collaborating Centres on ultraviolet radiation

In November 2013, ARPANSA met in Melbourne with representatives from three of the world's six WHO UV Collaborating Centres, including Public Health England, the Cancer Council Victoria and SunSmart, to discuss the role of UV science and its communication. The Cancer Council and SunSmart raised a number of issues highlighting the necessity and value of collaboration, and the interdependence of the agencies. Cancer Council Victoria is carrying out a $400,000 national survey on UV exposure and skin cancer this summer and data from the ARPANSA Ultraviolet Radiation network will be used to correlate sun exposure data.

Oversee security of radioactive sources and ensure emergency preparedness and response capability

ARPANSA maintained specialised radiation emergency capabilities in line with Australian emergency planning arrangements. During this quarter, ARPANSA emergency response personnel took part in a joint training exercise with other government agencies on advanced radiation and nuclear detection techniques. ARPANSA personnel also attended, as experts, an IAEA Response and Assistance Network capacity building exercise within the Fukushima Prefecture, Japan.

ARPANSA undertook a gamma spectroscopy capability exercise for Australasian radionuclide measurement laboratories. Six laboratories in Australia and New Zealand were sent a reference water sample for testing for six anthropogenic radionuclides and a report will be produced in the first quarter of 2014.

International Monitoring Network

As part of Australia's commitment to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), ARPANSA continued to operate and maintain radionuclide air particulate monitoring stations at Melbourne, Perth, Townsville, Darwin, the Cocos Islands, Macquarie Island, and Mawson Base (Antartica), plus two noble gas monitoring facilities, co-located with the air particulate monitoring stations in Melbourne and Darwin. ARPANSA also continued to act as a certified laboratory for analysis of check samples, as part of the CTBT laboratory network.

Standards and Guides

The Radiation Health Committee (RHC) is currently looking at revising the Radiation Protection Series (RPS) to address any gaps and looking to the IAEA Safety Standards for guidance in this respect. The RHC has reaffirmed the *Fundamentals for Protection against Ionising Radiation* as a non-mandatory document describing the basis for radiation protection, safety and security and amendments made to this draft document included suggestions arising from public consultation processes.

The RHC has noted progress on the draft Planned Exposure Code which will replace the *National Standard for Limiting Occupational Exposure to Ionizing Radiation (republished*

2002) with further amendments agreed. This Code takes into account the International Atomic Energy Agency's (IAEA) revised basic safety standards (GSR-3) and is expected to reduce regulatory burden as it will consolidate several existing codes into a single document.

Progress has been made on the development of the *Safety Guide for Radiation Protection of the Environment*.

Conferences and International Engagement

International Conference on the Sources, Effects and Risks of Ionizing Radiation Bali, Indonesia, 10–11 October 2013

ARPANSA's CEO, Dr Carl-Magnus Larsson, attended this Conference which was organised and hosted by the National Nuclear Energy Agency (BATAN) of Indonesia in cooperation with the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).

Indonesia has significantly increased its contribution to the work of UNSCEAR in the last few years, from having had a very low profile in UNSCEAR previously. The 'national mobilisation' in relation to UNSCEAR activities was seen in the number of supporting organisations; Ministry of Research and Technology, Ministry of Health, Nuclear Energy Regulatory Agency (BAPETEN), Indonesian Radiation Oncology Society, Indonesian Society of Radiology and the Indonesian Society of Nuclear Medicine.

Dr Larsson and UNSCEAR's scientific secretary Malcolm Crick were invited as representatives of UNSCEAR as cooperating organisation. Dr Larsson delivered a keynote lecture on health and environmental effects of radiation, participated in a press conference with Indonesian media, led a panel discussion on communication of radiation risks and participated in a panel discussion on establishment of programmes for data gathering on exposure and effects. Attendance at this forum is a key capacity building opportunity for ARPANSA in the South East Asia Pacific region.

The 38th Annual Conference of the Australasian Radiation Protection Society, Cairns, Australia 13-17 October 2013

In October 2013, ARPANSA delivered various presentations at the Australasian Radiation Protection Society (ARPS) Conference held in Cairns, Queensland, covering: naturally occurring radioactive materials; the Australian National Radiation Dose Register; radioactive waste management; environmental assessments; and health impacts from the Fukushima Dai-ichi accident. ARPANSA's attendance at this forum is a useful opportunity to network with other regulators responsible for uranium mining and milling and to publicise ARPANSA's work in protecting occupationally exposed workers.

Meeting of the International Commission on Radiological Protection (ICRP) Main Commission, and 2nd ICRP Symposium, Abu Dhabi, United Arab Emirates, 18-24 October 2013

The CEO of ARPANSA attended the Main Commission (MC) meeting in his capacity as MC member and Chair of Committee 5 (on environmental protection). The MC finalised the forthcoming publications on protection from exposure to radon (for which ARPANSA staff

has participated in the drafting), and on occupational intake of radionuclides. ARPANSA staff attended the 2nd ICRP symposium which among other things provided updates on tissue reactions (for example, in relation to exposure of the lens of the eye), medical radiation, and environmental assessments. The activities of the ICRP provides fundamental input to the establishment and further development of the global radiation protection framework; ARPANSA's continued involvement is highly important to the national application of this framework in Australia.

60th Session of UNSCEAR to the Fourth Committee of the UN General Assembly, and meetings in the margins - New York, USA, 23–25 October 2013

On 25 October 2013, ARPANSA CEO presented the report of the 60th Session of UNSCEAR to the United Nations General Assembly in a session chaired by the Ambassador of El Salvador to the United Nations New York, His Excellency, Mr Carlos García Gonzalez. Dr Larsson presented the general aspects of the report and the main findings from the UNSCEAR study of the Fukushima accident; *Levels and effects of Radiation Exposure due to the Nuclear Accident after the 2011 Great East-Japan Earthquake and Tsunami* (the scientific annex is planned to be published and presented in Japan in February next year). Dr Larsson reported that the 60th session of the UNSCEAR agreed on its main scientific findings from: (a) its assessment of levels and effects of radiation following the accident at the Fukushima Daiichi nuclear power station; and (b) effects of radiation exposure of children. The main scientific findings, together with information on work program and other activities, are presented in October each year to the Fourth Committee of the UN General Assembly. ARPANSA's attendance at this key forum provides a crucial opportunity for ARPANSA, as Australia's representative, to liaise with major international organisations, including the New York office of the United Nations Environmental Programme, under which UNSCEAR sits and to which the UNSCEAR Secretariat reports.

International Atomic Energy Agency Meetings of Safety/Security Committee Chairs and Commission on Safety Standards, 4–7 November 2013

ARPANSA's Dr Geoff Williams attended the Meeting of Safety and Security Committees as Chair of the Waste Safety Standards Committee (WASSC), and represented Australia at the 34th Commission on Safety Standards (CSS) at the (International Atomic Energy Agency) IAEA in Vienna, Austria. The functions of the CSS include setting the strategic directions for the IAEA's development of safety standards and endorsing draft standards for publication.

Issues of importance to Australia at the November meetings include agreement by the IAEA, to develop a stand-alone Safety Guide entitled '*Communication and Consultation with Interested Parties in the Regulatory Process*' which will address requirements on the regulator for communication with stakeholders, and also include guidance on the communication/outreach requirements that the regulator places on licensees/operators. At this meeting, the CSS endorsed for publication another important safety standard, the Safety Requirements document 'Decommissioning of Facilities'.

Australia (ARPANSA) will continue to push for tangible results in the integration of Safety Standards and Security Guidance for improving standards of nuclear safety and security.

Attendance at these meetings enables ARPANSA to keep abreast of, and contribute to, international best practice in nuclear and radiation safety and security, and the development of international safety standards and security guides.

International Atomic Energy Agency Waste Safety Standards Committee Meeting, 18–22 November 2013

ARPANSA's Dr Geoff Williams attended and chaired the IAEA Waste Safety Standards Committee (WASSC) in Vienna, Austria. ARPANSA's attendance and chairing of WASSC assists ARPANSA to drive the development of international safety standards for radioactive waste management and disposal.

At this meeting, a process was developed to review all the IAEA safety guides relating to waste management, in light of lessons learned from the Fukushima nuclear accident and in particular revision of a key safety guide focusing on accident recovery: '*Remediation Process for Areas Affected by Past Activities and Accidents*'. There was also discussion on the need to revise or develop standards for safety of spent fuel storage and ageing management of spent fuel in long-term storage.

WASSC was advised of progress on a large number of safety and security standards in the radioactive waste area which are being developed, including the approval of a document preparation profile (DPP) for a revised safety requirements document '*Safety of Research Reactors*'.

Integrated Regulatory Review Service Mission, Prague, Czech Republic, 14 November–1 December 2013

ARPANSA's Professor Peter Johnston was invited by the International Atomic Energy Agency (IAEA) to act as Deputy Team Leader for the Integrated Regulatory Review Service (IRRS) Mission to the Czech Republic. Involvement in IAEA Missions supports the Global Nuclear Safety Regime. This work is consistent with ARPANSA's Strategic Direction in International and Regional collaboration which has an outcome: Australian expertise contributing effectively to the development of the international safety and security frameworks. In addition, Australia strongly supports review missions that strengthen the Global Nuclear Safety Regime.

ARPANSA has subjected itself to an IRRS Mission and a Follow-up Mission which have proven very useful in defining directions for improvement of ARPANSA's regulatory activity. Participation in Missions in other countries improves the Global Nuclear Safety Regime, promotes international discussion about best practice approaches and exposes ARPANSA to good practices and pitfalls that other countries have experienced. Participation is part of an active quality improvement cycle for ARPANSA.

Radiological Dispersal Device Workshop Albuquerque, New Mexico USA, 18-22 November 2013

ARPANSA attended and led a delegation at the 2013 Radiological Dispersal Device (RDD) Workshop held at Sandia National Laboratories, Albuquerque which was a continuation of information exchange on the threat and impact of radiological dispersal devices with our

quadrilateral partners (Canada, United Kingdom and the United States). This workshop, which is held every two years at Sandia National Laboratories, focused upon the likelihood of success and the impact of theft and sabotage events in respect of radiological exposure devices and radiological dispersal devices. Information was exchanged on research on live agent tests using explosives with sources and understanding the characteristics associated with their dispersion. ARPANSA's attendance at this forum was beneficial from a security and emergency response planning perspective.

IAEA Fukushima Comprehensive Report Drafting Group Meeting: - Working Group 5 'Post-Accident Recovery' Drafting Meetings, International Atomic Energy Agency, Vienna, Austria 7-9 October 2013 and 6–12 December 2013

ARPANSA's Dr Geoff Williams attended and chaired Working Group 5 on 'Post-Accident Recovery' at meetings held at the IAEA in Vienna, Austria. This Working Group reported on progress and problems encountered to date. Chapter 5 of this IAEA Fukushima Comprehensive Report will include sections on: remediation of contaminated land; decommissioning/stabilisation of damaged nuclear facilities; radioactive waste management and disposal; and societal factors impacting recovery efforts. ARPANSA's involvement in chairing this chapter of this significant report provided the opportunity to contribute to the technical, societal and economic recovery in Japan following the major nuclear accident and learning valuable lessons from the Fukushima accident, for prevention, management of and recovery from such a major nuclear accident. Australia's successful remediation of the Maralinga former atomic weapons test site provided useful background and experience for this work.

Asia Pacific Metrology Program 2013, Taipei, Taiwan, 23–28 November 2013

In November, ARPANSA attended the Asia Pacific Metrology Programme (APMP), which is a group of national metrology institutes (NMIs) from the Asia-Pacific region engaged in improving regional metrological capability, held in Taipei, Taiwan. The APMP is also a Regional Metrology Organization (RMO) recognized by the International Committee for Weights and Measures (CIPM) for the purpose of worldwide mutual recognition of measurement standards and of calibration and measurement certificates.

ARPANSA delivered a presentation to the Technical Committee for Ionizing Radiation (TCRI) workshop describing changes to clinical doses in Australia due to the re-evaluation of energy correction factors and moving to direct calibration of clinical dosimeters. The TCRI meeting held on subsequent days consisted of each member country delivering a laboratory report outlining capabilities and progress since the last meeting. Of particular interest was the status of linac installations in the standards laboratories of China, Korea, Japan and Thailand, and new dosimetry standards under development in the region. The visit to Taiwan also allowed a laboratory visit during which an indirect comparison between the Taiwanese primary standards and ARPANSA primary standards of air kerma and absorbed dose in Co-60.

APMP meetings provide a valuable forum for information and knowledge sharing between laboratories in the Asia-Pacific region and ARPANSA's participation is essential for the quality assurance of the standards and calibration services which ARPANSA provides.

Publication Coordinators Meeting for CRP E2.10.08 "Development of Advanced Dosimetry Techniques for Diagnostic and Interventional Radiology", International Atomic Energy Agency, Vienna, Austria, 10-13 December 2013

ARPANSA attended the Publication Coordinators Meeting for CRP E2.10.08 held at the IAEA, in Vienna, Austria, to continue work undertaken since 2010. Research work has been completed and this meeting discussed the content and structure of the final publication with review of the principle draft chapters which cover a range of topics, including, but not limited to, paediatric dosimetry, interpretation of clinical dose data, comparison of calibrations and dosimetry procedures for the determining skin dose.

ARPANSA's work at this meeting was a valuable opportunity to contribute to research on medical radiation dose measurement and interpretation of diagnostic and interventional radiology with a focus on paediatric dosimetry, computed tomography (CT), skin dose measurements and recent modern imaging modalities, such as cone beam computed tomography and tomosynthesis. The final document is expected to be finalised in 2014 and published in 2015.

Federal Authority for Nuclear Regulation, Abu Dhabi, United Arab Emirates, 16 December 2013

ARPANSA attended at the Federal Authority for Nuclear Regulation (FANR) in Abu Dhabi in December at the request of FANR to deliver a presentation on the establishment and functions of the National DRL Service and the ACDS. The meeting was attended by FANR regulators and inspectors as well as numerous medical physicists from regional and district hospitals. ARPANSA offered ongoing assistance and a consultancy to FANR for both projects if deemed appropriate.

Details of any Breach of Licence Conditions by a Licensee

Breaches with Safety Implications

Licensee	Number	Nature of breach	Action
PETNET Australia Pty Ltd	F0211	Breach of S31(2) of the Act by failing to follow licence conditions - operation of the PETNET cyclotron without a functioning safety interlock system which resulted in a breach of Regulation 49.	Corrective actions have now been undertaken and the facility has returned to compliance.
PETNET Australia Pty Ltd	F0211	Breach of S31(2) of the Act by failing to follow licence conditions - development and implementation of a Safe Operating Procedure with significant implications for safety was undertaken without the appropriate approval required under ARPANS Regulation 51.	Corrective actions have now been undertaken and the facility has returned to compliance.

Breaches with No or Minor Safety Implications

There were three breaches with minor or no safety implications recorded during the quarter as follows:

- Disposal of controlled apparatus without prior approval from ARPANSA. The equipment was returned to an X-ray equipment supplier who is appropriately licensed to deal with the devices.
- Failure to undertake radiation monitoring surveys around controlled apparatus at the recommended frequency.
- Possession of a controlled apparatus without the appropriate licence in place. However the controlled equipment was not used by the licence holder until an appropriate licence was obtained.

These breaches were assessed to have minor safety implications, corrective actions were taken by the licence holder and no enforcement action was considered necessary.

Facilities Licensed Under Part 5 of the ARPANS Act

Licensee	Number	Type	Comment
Australian Nuclear Science and Technology Organisation (ANSTO)	F0277	Facility	Licence to prepare a site for the Interim Waste Store at Lucas Heights Science and Technology Centre.
Australian Nuclear Science and Technology Organisation (ANSTO)	F0279	Facility	Licence to construct the Interim Waste Store at Lucas Heights Science and Technology Centre.
Australian Nuclear Science and Technology Organisation (ANSTO)	F0270	Facility	Licence to prepare a site for the ANSTO Nuclear Medicine Molybdenum-99 facility at Lucas Heights Science and Technology Centre.
Australian Nuclear Science and Technology Organisation (ANSTO)	F0280	Facility	Licence to operate the 1 MV Compact accelerator within the Centre for Accelerator Science at Lucas Heights Science and Technology centre up to hot commissioning.

Transport of Radioactive Material

ARPANSA approved the package design of model 1860A and issued the following certificate of design to Analogue and Digital Measurements Pty Limited, Australia:

- AUS/2013-47/B(U)-96

ARPANSA validated the Certificate of a Package Design, RA/0099/B(U)F-96, revision 2, issued by the Competent Authority of Argentina for a B(U) Type Package, and the certificate of a Package Design, CZ/001/B(U)-96, revision 3, issued by the Competent Authority of Czech Republic for a B(U) Type Package and issued the following certificates of validation to ANSTO:

- AUS/2013-48/B(U)F-96.
- AUS/2013-49/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

The Council met at ARPANSA's Miranda offices on 28-29 November 2013. A full summary of the meeting is available at: www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm

Council was briefed on the Australian Government's Deregulation Agenda and the implications for the revision of the ARPANS Act which has now been included in the deregulation agenda and will be managed through the Deregulation Section of the Department of Health.

Council discussed the Roles and Expectations of ARPANSA's Advisory Bodies, the Radiation Health and Safety Advisory Council (RHSAC), the Radiation Health Committee (RHC) and the Nuclear Safety Committee (NSC) and how interactions between these groups might be enhanced to ensure optimal benefit from the skills and expertise of members.

Council was briefed on ARPANSA's Communication Strategy and Plan and Council discussed outcomes from the Australasian Radiation Protection Society (ARPS) 2013 Conference which had included considerable discussion about how this profession communicates radiation risks.

Council was updated on ARPANSA's activities, including the status of work with Medical Imaging activities, progress of the radon progeny technical working group (RPTWG) and the strategy for the revision of the ARPANSA Radiation Protection Series framework that implement the new hierarchy of documents that had been endorsed by Council in December 2011. Council also unanimously endorsed content of the *Fundamentals for Protection against Ionising Radiation* for publication and unanimously endorsed the Statement and Background Paper on the *Management of Risks in the Transport of Radioactive Material in Australia* for forwarding to the CEO.

Council also acknowledged the exemplary and dedicated contribution that Ms Sylvia Kidziak AM has made to Council and ARPANSA. This meeting was the last for Ms Kidziak as Chair of the Council after holding this position from 2002-2013.

Reports to the CEO from the RHSAC (s.20(f) of the Act)

The Council forwarded advice on the *Management of Risks in the Transport of Radioactive Material in Australia* to the CEO of ARPANSA on 13 December 2013. This advice can be found at www.arpansa.gov.au/Publications/RHSAC/rhsac_stat.cfm

Radiation Health Committee

The Radiation Health Committee met on 13 November 2013 at ARPANSA's office in Miranda, New South Wales. A full summary of the meeting is available at: www.arpansa.gov.au/AboutUs/Committees/rhcmt.cfm

Standards Australia delivered a presentation on the role and work of the organisation.

The Committee noted ARPANSA's intention to expand the mapping of the Radiation Protection Series (RPS) and to undertake a gap analysis, inspired by the IAEA safety standards. This will be used as the basis for a revised work program.

The Committee reaffirmed the *Fundamentals for Protection against Ionising Radiation* as a non-mandatory document describing the basis for radiation protection, safety and security. The *Fundamentals* is the top level document in the new Radiation Protection Series hierarchy and the Committee noted that amendments made to the draft have included suggestions received in public consultation processes.

The Committee approved the final version for publication in the radiation protection series, subject to revision of page 2 and endorsement by the Radiation Health and Safety Advisory Council.

Progress on the draft Planned Exposure Code which will replace the *National Standard for Limiting Occupational Exposure to Ionizing Radiation (republished 2002)* was noted and further amendments agreed. This Code takes into account the International Atomic Energy Agency's (IAEA) revised basic safety standards (GSR-3) and is expected to reduce regulatory burden as it will consolidate several existing codes into a single document. A workshop on the draft Code will be considered for the 2014 ARPS conference.

The Committee noted progress on the development of the *Safety Guide for Radiation Protection of the Environment* and agreed on the composition of a consultative group.

The proposed Amendment of the *National Directory for Radiation Protection* (covering Schedules 5, 6, 9 and 13) was endorsed by the Australian Health Ministers' Advisory Council (AHMAC) in July and is now being considered out of session by the Standing Council on Health (SCoH). In relation to the proposed National Directory amendment concerning Personal Radiation Monitoring Service (PRMS) certification, the Committee endorsed the view that assessment criteria are important to ensure that reported doses are legally defensible. Comment is to be sought on the existing draft from regulators, current PRMS providers and key users. In relation to the National Directory amendment relating to the control of IPLs and lasers for cosmetic use, the Committee considered the preferred and alternative options proposed by the working group and agreed that the draft proceed to a Consultation Regulatory Impact Statement. In relation to the proposed amendment concerning user disposal, progress was noted and a number of technical points were debated. The Committee supported the Generalised Derived Constraint level of 100 μSv per year to the most exposed person as the basis for calculation of the radioisotope exempt activity below which no approval is required for disposal to landfill, sewer or atmosphere. The Committee also supported the use of 10 × exempt activity per package for disposal to landfill. The use of ERICA[1] screening values for triggering investigations into environmental effects was supported on the basis that further expert assessment be undertaken by ARPANSA.

The Committee considered the training course for accredited assessors in relation to the regulation of source security plans and agreed that the resulting qualification be included in

[1] The ERICA Tool is a software system that has a structure based upon the tiered ERICA Integrated Approach to assessing the radiological risk to terrestrial, freshwater and marine biota.

the National Directory as a nationally recognised qualification. It was noted that information on how to become an accredited assessor is to be made available on the ARPANSA website.

The Radiofrequency Literature Review Report has been completed and the Committee noted that while adequate protection of the public is still provided by Radiation Protection Series 3 (RPS3) the document is quite complex. The Committee supported revision of the standard to a more simplified form.

The Committee noted reports for recent meetings of the Radiation Health and Safety Advisory Council, the Nuclear Safety Committee, the 35th meeting of the IAEA Waste Safety Standards Committee (WASSC) and the 34th meeting of the IAEA Radiation Safety Standards Committee (RASSC 34).

The Committee also noted a recent report on the Australian Incidents Register and a Victorian proposal currently before the Standing Council on Health (SCoH) to ban the use of solaria. The next Radiation Health Committee meeting will be held on 5 March 2014 at ARPANSA's Miranda offices.

Nuclear Safety Committee

The Committee met on 1 November 2013 at ARPANSA's office in Miranda, New South Wales. A full summary of the meeting is available at:
www.arpansa.gov.au/AboutUs/Committees/nscmt.cfm

The CEO advised the Committee that he had issued a siting licence to the Australian Nuclear Science and Technology Organisation ('ANSTO') on 4 October 2013 to prepare a site for the proposed ANSTO Nuclear Medicine Molybdenum-99 Facility which will be used to produce molybdenum-99 for manufacturing radiopharmaceuticals.

ANSTO submitted applications to ARPANSA requesting approval for licences to prepare a site for, and to construct, an Interim Waste Store which is a purpose-built store for intermediate level solid radioactive waste returning from France towards the end of 2015. The Committee discussed various safety aspects of ANSTO's proposed application for licences to prepare a site for, and to construct, an Interim Waste Store which is a purpose-built store for intermediate level solid radioactive waste returning from France towards the end of 2015. Aspects considered included: waste storage methodology; plans and arrangement for ongoing maintenance of the store; duration of storage; and maintaining ongoing oversight of the store. The CEO requested the Committee provide more detailed advice out-of-session which was subsequently provided by letter dated 22 November 2013.

The Committee discussed various aspects about the licensing of ANSTO's SyMo facility which will be used to condition intermediate level liquid waste, arising from ANSTO's production of molybdenum-99, into an immobilised form using Synroc technology. Issues considered included: safety of the proposed Synroc technology; adequacy of the risk assessment conducted; safety regulations during construction; and proposed plans for future decommissioning. The CEO requested the Committee to provide more detailed advice out-of-session.

The Nuclear Safety Committee discussed various safety aspects relating to ANSTO's licence to operate the Australian Synchrotron and in particular the licensing requirement that ANSTO provide ARPANSA with the updated plans and arrangements, safety analysis report, and operating limits and conditions by September 2013. The Committee discussed safety aspects of these documents submitted, including the safety of the future use of the imaging and medical beam-line. The CEO requested Members provide further advice out-of-session.

Members were updated on the safety of controlled facilities at ANSTO which included a brief outline of the inspections undertaken, and applications received, assessed and approved since the June 2013 meeting.

The CEO informed the Committee of the main items discussed at the Radiation Health and Safety Advisory Council meeting of the 8-9 August 2013. The representative of the RHC discussed the 23 July 2013 meeting and the current progress on projects including the *Fundamentals for Protection against Ionising Radiation* which has been released for public comment. Comments received were being addressed in an updated draft.

Committee members were provided with reports for information regarding ARPANSA's involvement and collaboration at IAEA technical standards committees on Radiation, Waste and Transport Safety, and at the Fukushima Comprehensive Report Drafting Group meeting.

The Committee was informed that a transport incident had occurred involving the movement of radiation sources from Queensland to Germany when a package lid became dislodged during the movement and was later detected on arrival in Germany. Safety aspects pertaining to the incident were discussed.

ARPANSA provided an update on the current situation in Japan following the Fukushima nuclear accident. Discussions on how the Japanese are monitoring the site including seawater; plans for remediation; and operation of reactors.

The Nuclear Safety Committee will next convene on 28 February 2014.

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 and Ageing may authorise ARPANSA officers to approve import permissions.

ARPANSA authorised officers issued 216 permits for medical radioisotopes including 2 twelve month and 214 single shipment permits.

ARPANSA authorised officers also issued the total of 169 permits for customs release of non-medical radioisotopes, comprising: 77 urgent permits; 89 standard permits; and 3 twelve month permits.