Australian Government

Australian Radiation Protection and Nuclear Safety Agency

QUARTERLY REPORT

OF THE

CHIEF EXECUTIVE OFFICER

OF ARPANSA

FOR THE PERIOD 1 JULY 2012 TO 30 SEPTEMBER 2012

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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

25 October 2012

The Hon Catherine King MP
Parliamentary Secretary for Health and Ageing
Parliament House
Canberra ACT 2600

Dear Parliamentary Secretary

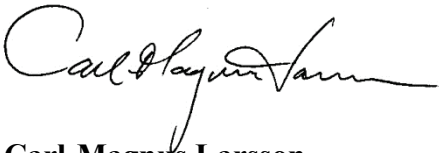
The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer (CEO) of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- 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
- facilities licensed under Part 5 of the Act.

I am pleased to provide you with a report, meeting the requirements of the Act, covering the period 1 July 2012 to 30 September 2012.

As you would be aware, 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 and Regulation

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

During the quarter, draft NDRP Amendment No. 6 (covering a range of topics including: exemption of lighting products containing krypton-85 from authorisation requirements; update of the licensing requirements for chiropractors; clarification of the incident reporting requirements and other editorial matters) was released for public comment. A number of submissions were received and are being taken into account in preparation of the final version of the amendment.

Significant Licensing Activities

- ARPANSA approved an application under Regulation 51 of the ARPANS Regulations made by ANSTO to operate the Radiochemical Laboratories at the Camperdown Facility in August 2012. A report showing results obtained during commissioning tests and a revised Safety Analysis Report will be submitted to ARPANSA within 90 days. The first report will confirm that the design and safety objectives for the Radiochemical Laboratory including the shielding adequacy will be met. Details of this process will also be included in the Safety Analysis report.
- Approval was granted by ARPANSA and an amended licence issued to the ANSTO Bragg Institute to operate the SIKA cold triple axis neutron spectrometer up to and including testing operations.

- ARPANSA consented to the surrender of the facility licence for decommissioning of the National Medical Cyclotron at Camperdown.
- ARPANSA consented to the surrender of the facility licence for the construction of the ANSTO Camperdown facility.

Inspections

ARPANSA undertook a series of seven inspections and two site visits during the quarter. These inspections 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 now posted on ARPANSA's website.

International Engagement

World Health Organization (WHO) International Electro Magnetic Field (EMF) project

ARPANSA is a WHO Collaborating Centre for Radiation Protection and a member of the WHO EMF Project and regular contributor to EMF fact sheets prepared by WHO. In July 2012, ARPANSA provided input into a draft brochure prepared by the WHO entitled "Health and safety of wireless networks: A guide for local authorities".

24th Meeting of the International Atomic Energy Agency (IAEA) Transport Safety Standards Committee (TRANSSC)

The 24th Meeting of the IAEA TRANSSC was held during 16-20 July 2012. The meeting resolved the key issues related to development of Transport Safety documents including TS-G 1.2 and TS-G 1.6, and in harmonisation of the requirements of the 2012 edition of Transport Regulation with United Nations Model Regulations noting that TS-R-1 is expected to be published in the last quarter of 2012.

2nd Extraordinary Meeting of the Convention on Nuclear Safety

Summary

The 2nd Extraordinary Meeting (EM) of Contracting Parties to the Convention on Nuclear Safety was held at the IAEA in Vienna, Austria from 27-31 August 2012. An Organizational Meeting held on 31 August 2012 elected officers for the next Review Meeting of the Convention in 2014. Reports of the six thematic topic groups established at the EM to share lessons learned and actions taken to strengthen safety identified over 200 lessons and actions. In subsequent sessions, the EM considered Contracting Parties' proposals to improve the effectiveness of the Convention through possible amendments to the instrument or the supporting rules and guidelines. Australia's proposal for parties to demonstrate improvement in safety by providing evidence of implementing the *IAEA Safety Fundamentals* and *Requirements* was incorporated into the guidelines by consensus. The EM agreed to establish a working group to consider US, Russian and Swiss proposals in lieu of being able to achieve a consensus at the EM.

Lessons Learned From the Fukushima Daiichi Nuclear Accident

Contracting Parties discussed actions to enhance nuclear safety, taking into account the lessons learned from the Fukushima Daiichi accident in six topical groups. The topics of the groups were: (1) external events, (2) design issues, (3) severe accident management and recovery (on-site), (4) national organisations, (5) emergency preparedness and response and post-accident management (off-site), and (6) international cooperation. The benefit to Contracting Parties of identifying and discussing key technical issues was to glean insights which would not have been possible by any one Contracting Party working in isolation.

The actions identified will be reflected in Contracting Parties' National Reports for the Sixth Review Meeting of the Convention, thereby enabling a more robust peer review process.

Visit to Health Protection Agency (HPA)

In August, an ARPANSA representative visited the Health Protection Agency (HPA) in Didcot, England. The main purpose of the visit was to discuss technical aspects of the UNSCEAR Fukushima assessment of doses to the public and the environment. ARPANSA leads the Expert Group undertaking this work and the HPA is a major contributor.

56th General Conference of the International Atomic Energy Agency, Vienna, Austria, 17–21 September 2012

The General Conference (GC) is a yearly event that brings together all IAEA Member States for agreement on budget, work program, resolutions, etc. A large number of side-events are held in the margins of the Conference, such as the Senior Regulators' Forum and the Scientific Forum. More than 3,000 delegates attended, representing 155 Member States. During the opening plenary, the Chair of the 55th GC, Ambassador Cornel Feruţă, Romania, handed over to Ambassador Carlos Barros Oreiro, Uruguay, who was unanimously elected Chair of the 56th GC. The GC welcomed the Republics of Fiji, San Marino and Trinidad &Tobago as members of the Agency – full membership will be granted when relevant accession instruments have been deposited with the Agency. The Australian delegation was headed by Australia's new Ambassador in Vienna, David Stuart. The outcomes of the Conference are reported on the IAEA's website.

Accident Reporting and Guidance Operating System (ARGOS) Consortium Meeting.

The annual Accident Reporting and Guidance Operating System (ARGOS) Consortium meeting was held in Copenhagen, Denmark in September 2012. Nine consortium member countries attended the meeting. The meeting discussed the use of ARGOS over the past year by consortium member countries, future ARGOS development, and an approach for enabling more joint development across consortium member countries.

New Zealand Interagency Committee on the Health Effects of Non-Ionising Fields

ARPANSA provided a report on "Australian EMR activities on the Health effects of Electromagnetic Fields" to the meeting of the New Zealand Interagency Committee on 18 September 2012.

Promote the Effective Use of Radiation in Medicine

Radiotherapy Calibration Service

The radiotherapy calibration service supports the accuracy of radiation dose delivery in treatment centres. It is currently based upon the ARPANSA cobalt-60 gamma-ray source facility. This quarter, calibrations for four treatment centres were undertaken. Progress continues towards the introduction of a direct calibration service in 2012 using the ARPANSA linear accelerator (linac) megavoltage X-ray beams. To this end, a comparison between ARPANSA and the BIPM (Bureau International des Poids et Mesures) commenced in 2012. This work will compare the absorbed dose in the ARPANSA linac beams as measured by the two agencies.

Australian Clinical Dosimetry Service (ACDS)

The ACDS commenced auditing radiotherapy centres in 2011. This program audits the accuracy of radiation dose delivery from linacs in treatment centres to assure correct delivery of radiation dose in treating patients. The audits are conducted at a range of levels including basic output audits of operational linacs, pre-operational audits of new linacs, audits of the whole radiation field using a two-dimensional detector array and audits involving the 'mock' treatment of a simulated human torso made from tissue equivalent plastic which allows end-to-end audit of the treatment planning and delivery process.

This quarter, the ACDS reported on ten linacs from five centres using the new Optically Stimulated Luminescence Dosimeter reference dosimetry audit. Two of the higher accuracy reference audits were also performed. Basic output audits have been reported on a total of 65 linacs to date, and the higher accuracy dosimetry audits on 17 linacs. In quarter three the end-to-end, Level III audit, was released and five audits at five centres across three states were successfully completed.

Australian Diagnostic Reference Levels (DRL) for Medical Imaging

Collection of relevant data for national diagnostic reference levels for adult computed tomography is ongoing, with the development of further modules to cover the modalities of interventional radiology, mammography and nuclear medicine. ARPANSA has written to the Royal Australian and New Zealand College of Radiology regarding the adoption of the work carried out so far for paediatric DRLs. Preliminary meetings have been held with the Cardiac Society of Australia & New Zealand for interventional cardiology DRLs and with Siemens Ltd Australia for mammography DRLs. Discussions have been held with Australian and New

Zealand Society of Nuclear Medicine to formulate a working group to initiate a survey into clinical radiopharmaceutical doses.

Protection of People from Natural Sources of Radiation

Maralinga Dose Assessment

An 18 month program to reassess current radiation doses received by the indigenous population at Maralinga and Oak Valley was completed. The purpose of the investigation was to check clearance criteria and assess the radiation doses for the Taranaki restricted area and to the indigenous population at Oak Valley, using improved knowledge of habit, the physical environment and changes in radiation protection assessment methods. The ARPANSA study found that the radiation safety measures that were implemented during the 1995-2000 Maralinga Project were adequate and there was no evidence that would justify modification. This work was undertaken under a Memorandum of Understanding between ARPANSA and the Department of Resources, Energy and Tourism.

Radiation Protection of the Environment

A review of existing Australian radionuclide activity concentration data in non-human biota inhabiting uranium mining environments was completed. The project aim was to identify any shortcomings in data, including biota types and environmental conditions, and to identify those areas for which data is most lacking, taking into account the location of current and prospective uranium mines in Australia. The review summarised and evaluated existing radionuclide concentration data in non-human biota common to Australian uranium mining environments that has been collected by a range of organizations over the past 40 years. It identified shortcomings in methodology and discrepancies in data sets. The review recommended that the publication of the dataset for utilisation by the industry sector. This work was undertaken under a Memorandum of Understanding between ARPANSA and the Department of Resources, Energy and Tourism.

Exposures in Uranium Mining and Naturally Occurring Radioactive Materials (NORM) 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 ANRDR currently holds dose history records for more than 24,700 workers from the uranium mining and milling industry. In July 2012, the first upload of dose records to the ANRDR related to Ranger Uranium Mine occurred, following a change to Northern Territory legislation.

Measurement and Assessment

Following the Fukushima Daiichi accident in Japan, ARPANSA has continued screening of food samples from Japan as part of the DAFF Biosecurity (Department of Agriculture, Forestry and Fisheries) Imported Food Program. ARPANSA continued with the

radioanalytical work on pre-digested environmental samples from CSIRO, with the expectation that this activity would end in October this year.

The ARPANSA environmental radiochemistry laboratory underwent a technical reassessment audit conducted by the National Association of Testing Authorities (NATA) Australia. ARPANSA is waiting on the NATA formal report of the reassessment

Work has also continued on the analysis of naturally occurring radionuclides in food, with the aim to estimate the background radiation dose contribution from foods in the typical Australian diet. A report titled *A Survey of Naturally Occurring Radioactive Material Associated with Mining* was published in August 2012.

Work has commenced on the development of an in-situ sampling device for the pre-concentration of radioactive cesium from seawater. This device will be deployed at ports visited by nuclear powered warships, where initially it will be used to determine the baseline levels of cesium 137 (Cs^{137}) in the seawater and eventually for regular monitoring of these sites.

Monitoring and Mitigating Population Exposures to Electric and Magnetic Fields (EMF) and Electromagnetic Radiation (EMR) and Solar Ultra Violet Radiation (UVR)

ARPANSA continued to respond to a large range of enquiries related to potential health effects from exposure to EMF and UVR. Predominantly, enquiries are related to electric and magnetic fields from electrical power infrastructure, including the radiofrequency transmissions from smart meters as well as radiofrequency arising from mobile phone base stations and handsets.

The ARPANSA base station survey program informs the public about actual exposures in close proximity to mobile phone base stations and validates mathematical predictions provided in the ARPANSA Environmental EME Report prepared by the industry. One mobile base station survey (from Sunbury VIC) was conducted in August and the results were posted on the ARPANSA website. Planning and preliminary measurements by ARPANSA staff around the Alfredton VIC (Ballarat) site were commenced.

The ARPANSA UVR network continued to provide real-time ‘live’ UV Index data for ten Australian sites and three Antarctic bases via the ARPANSA website. The UV Index data (which is updated every minute) is also provided to mobile phone users through third-party applications. The ARPANSA website advises of protective strategies for avoiding excessive sun exposure and now includes a recent publication by ARPANSA staff in the US Skin Cancer Foundation Journal titled “Ready to wear Sun Protection: Clothing fits the bill”.

A proposal to revise and update the Sun Protective Clothing Standard has been submitted by ARPANSA to Standards Australia with the support on numerous stakeholders. Research projects measuring the UVR exposures of outdoor workers were carried out in collaboration with the Cancer Council Victoria and also with the Australian National University (ANU) for

indoor workers. The study with ANU has already resulted in a publication in a scientific journal (Photochemistry and Photobiology), with further publications planned.

ARPANSA also hosted a UV Alert meeting, now a joint Australian/New Zealand committee, looking at making the dissemination of information to the public on UV levels and the UV Index more effective (ARPANSA, State Cancer Councils, Bureau of Meteorology, Health and Safety NZ as well as the Cancer Society of New Zealand). ARPANSA also responded to numerous requests for information on the UVR hazards of nail curing lamps used in beauty salons (previously measured by ARPANSA) following reports of skin cancers in users in the United States.

Security of Radioactive Sources, and Emergency Preparedness

COAG Recommendations for Radiological Material

The National Register for High Activity Sealed Radioactive Sources database is operating and ARPANSA continues to work with the jurisdictions to ensure the integrity, harmonisation and availability of the data.

ARPANSA is also continuing to work with jurisdictions and licence holders on the compliance of security plans in accordance with the *Code of Practice for the Security of Radioactive Sources*. Training courses on the Transportation Security of Category 1, 2 and 3 radioactive sources have been delivered to all jurisdictions except Tasmania; refresher training programs in transportation security continue to be delivered as required.

ARPANSA is negotiating with a Registered Training Organisation (RTO) for the delivery of ARPANSA's Vocational Graduate Certificate in Radiation Security Advice. This will provide a pool of nationally qualified security advisers for the endorsement of Source Security Plans in all states and territories. ARPANSA submitted competencies for a Radiation Security Advisor certification scheme to the Australian Skills Quality Authority. This capacity building scheme aims to assist the jurisdictions in their security responsibilities with the availability of appropriately trained and qualified Radiation Security Advisors.

Security of Radioactive Materials and Nuclear Facilities

The joint ARPANSA-ASNO Physical Protection & Security Review Working Group (PPS WG) is reviewing the ANSTO security arrangements of the OPAL Research Reactor as part of a periodic security review. The PPS WG has met several times to develop and implement the review methodology in accordance with international best practice, and has also undertaken the first joint ARPANSA-ASNO security inspection of the OPAL Research Reactor.

ARPANSA has embarked upon a review of the Import and Export of radioactive material which aims to better integrate communication and information sharing between ARPANSA and the Australian Customs and Border Protection Service.

ARPANSA will be hosting an IAEA funded regional Transport Security of Nuclear Material training course at the end of the year. The course will involve regulatory and operational representatives from our region and will assist capacity building by demonstrating international best practice in this field.

Emergency Response Capability

ARPANSA maintained specialized radiation emergency capabilities in line with Australian emergency planning arrangements. The ARPANSA Radiation Emergency Operations Unit (REOU) continued its training cycle by providing emergency response training to ARPANSA staff and a number of government agencies. The REOU also provided briefings on the Unit's role and capabilities to government agencies.

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 monitoring stations at Melbourne, Perth, Townsville, Darwin, the Cocos Islands, and Macquarie Island, including two noble gas analyser facilities, collocated with the air monitoring stations in Melbourne and Darwin. The installation of the station at Mawson, Antarctica, was carried out during the quarter, including a five-week tuning and initial testing phase as required under the installation contract. ARPANSA is now waiting on formal notification from the CTBT Organisation (CTBTO) that the station is officially in the contracted Testing & Evaluation phase, and thus routine operations and maintenance can be initiated.

In addition to operating and maintaining the stations, ARPANSA also operates the Australian Radionuclide Laboratory under contract to the CTBTO. This laboratory has the role of testing samples obtained by other monitoring stations in the CTBT network. Six such samples were analysed during the quarter.

Details of any Breach of Licence Conditions by a Licensee

Breaches with safety implications

Licensee	Number	Nature of breach	Action
Australian Defence Force	F0252	Breach of S30(1) of the Act. Possession of a linear accelerator for industrial radiography at Port Wakefield without the appropriate facility licence.	A licence application was subsequently submitted by Defence and approved. The unauthorised possession was determined to be an administrative error and, as a consequence, no enforcement action was taken.
Australian Defence Force	S0042	Breach of S31(2) of the Act by failing to follow licence conditions. Unauthorised disposal of 87 items of controlled apparatus and controlled material.	Defence has taken measures to prevent the reoccurrence of such unauthorised disposals. The disposals were determined to have low safety significance and, as a consequence, no enforcement action was taken.

Facilities Licensed Under Part 5 of the ARPANS Act

Licensee	Number	Type	Comment
Australian Nuclear Science and Technology Organisation (ANSTO)	F0230	Facility	Consent to surrender the facility licence for the Stage 2 Decommissioning for the Camperdown Facility
Australian Nuclear Science and Technology Organisation (ANSTO)	F0235	Facility	Consent to surrender the facility licence for the completion of construction of the Camperdown facility

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 on the 9-10 August 2012 in Adelaide. A full summary of the meeting is available at http://www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm.

The Council met at the premises of the South Australian Environment Protection Authority on 9 August 2012 and was updated on current regulatory issues facing South Australia. On 10 August 2012 Council discussed radiation issues facing the uranium mining industry in an open forum with invited guests from a number of mining companies and other organisations. Topics included: education of radiation safety officers, safe transport of radioactive material and risk perception.

At the meeting, the Council also:

- Recommended to the CEO that RPS 2.2 *Safety Guide for Approval Processes for the Safe Transport of Radioactive Materials (2012)* be adopted.
- Considered the actions taken by ARPANSA to address the recommendations of Council's 2010 *Scoping Review of Issues Related to the Management of Intermediate Level Radioactive Waste in Australia*. This included review of a draft regulatory guide for ARPANSA licence applicants: *Licensing of Radioactive Waste Storage and Near-Surface Disposal Facilities*.
- Noted the recent International Commission Radiological Protection recommendations on assessment of radon progeny dose and supported a project to determine radon progeny dose conversion factors for the Australian Uranium mining context.
- Discussed the implementation of the Australian National Radiation Dose Register across the Uranium mining sector.

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

No reports from the RHSAC were provided to the CEO of ARPANSA during the quarter.

Radiation Health Committee

The Committee met on the 18 July 2012 at ARPANSA's Yallambie office. A full summary of the meeting is available at: www.arpansa.gov.au/AboutUs/Committees/rhcmt.cfm.

At the meeting, the Committee:

- Endorsed the RHC Strategic Directions for the 2012-14 triennium.

- Approved the proposed NDRP Amendment No. 6 to be released for public comment.

- Approved the final draft *Safety Guide for Approval Processes for the Safe Transport of Radioactive Materials (2012)* for publication.

- Considered the draft *Fundamentals for Protection against Ionizing Radiation* and agreed that it needed to align more closely with the *IAEA Fundamental Safety Principles* and ensure that safety and security were both covered.

- Endorsed a project plan to develop a safety guide on the closure of sites contaminated with radiation as a result of past and present activities.

- Agreed in-principle that the medical code (RPS 14) should be aligned with the new IAEA Basic Safety Standards. Project planning for a review of RPS 14 would commence when the key responsibilities in the proposed *Planned Exposure Code* have been established. Revision of the medical safety guides (RPS 14.1, 14.2 and 14.3) will follow.

- Approved the publication of a revised RHC *Statement on Safe Handling of Deceased Persons Recently Treated with Radioactive Material*.

Nuclear Safety Committee

The Committee did not meet during the quarter. The next meeting is scheduled for 26 October 2012.

Details of Directions Given by the Minister

No directions were given by the Minister under section 16 of the *ARPANS 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 to Health and Ageing may authorise ARPANSA officers to approve import permissions.

ARPANSA authorised officers issued 338 permits for medical radioisotopes including no urgent single shipments, 324 single shipments and 14 twelve monthly permits.

ARPANSA authorised officers also issued 206 permits for customs release of non-medical radioisotopes, comprising 109 urgent single shipments, 78 standard single shipments and 15 twelve monthly permits, with four cancelled permits.

Transport of Radioactive Material

ARPANSA approved the shipment of nuclear material from Lucas heights to Sydney Airport and issued the following certificate to ANSTO:

- AUS/2012-45/B(U)F-96T