Australian Government

Australian Radiation Protection and Nuclear Safety Agency

QUARTERLY REPORT

OF THE

CHIEF EXECUTIVE OFFICER

OF ARPANSA

FOR THE PERIOD 1 JANUARY 2012 TO 31 MARCH 2012

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Notice

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Letter of Transmittal

4 May 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 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 January 2012 to 31 March 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 with the State and Territory jurisdictions through the Radiation Health Committee (RHC). No development of NDRP matters occurred during this quarter.

Significant Licensing Activities

- ARPANSA approved the ANSTO OPAL reactor safety submission to change from an 8 hour shift roster to a 12 hour shift roster.
- ARPANSA issued a licence to Australian Customs to operate a transmission X-ray scanner for a trial period.

Inspections

ARPANSA continued its inspection programme, and undertook a series of 19 inspections and 7 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.

Stakeholder Engagement

Fukushima Seminar

ARPANSA hosted a seminar on the Japan Nuclear accident at Canberra in March. The purpose of the seminar was to provide a basis for an informed discussion that will assist in coordinating and integrating objectives and activities in nuclear safety, security and safeguards in Australia and the region. Commonwealth agencies attended the seminar.

Australian ERICA Workshop

An Environmental Risk from Ionising Contaminants: Assessment and Management (ERICA) Workshop was jointly sponsored by the Department of Resources, Energy and Tourism and ARPANSA in Melbourne and Perth in March. The ERICA Tool is a software system that applies the tiered ERICA Integrated Approach to assessing the radiological risk to terrestrial, freshwater and marine biota. The objective of the Australia-focused workshops was to help attendees improve their knowledge and understanding of issues surrounding radiological protection of the environment, and provide instruction on the use and benefits of the ERICA tool in conducting environmental assessments. Commonwealth agencies, State regulators and industry attended the workshop.

International Engagement

Nuclear Emergency at Fukushima, Japan

The Japanese Authorities announced in December that the reactors stricken by the earthquake and tsunami of 11 March 2011 have now been brought to ‘cold shutdown’ and that conditions are stable. ARPANSA continues to monitor the radiation situation in Japan and beyond in order to properly advise the Australian Government and public on radiation protection and nuclear safety issues. ARPANSA radiation protection advice is provided through the ARPANSA website which is updated on a regular basis.

United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) Fukushima Meeting

UNSCEAR assesses the radiological impact of the events at the Fukushima Dai-ichi NPP accident. The aim is to determine the magnitude of the releases of radiation into the atmosphere and ocean, and to assess the range of radiation doses received by the public, workers and the ecosystem.

ARPANSA is Expert Group Leader and Rapporteur for dose and risk assessment to the public and the environment. Progress in assessing exposure was discussed in Vienna from 30 January to 3 February.

Comprehensive Nuclear Test Ban Treaty Organization Working Group B meeting

The thirty eighth session of Working Group B was held in Vienna on the 6-24 February. This working group dealt with technical issues relating to the verification of the treaty.

IAEA Technical Reports on Natural Series Radionuclides

ARPANSA is contributing to three IAEA Technical Report Series documents: "Measurement and Calculation of Radon Releases from NORM Residues", "Environmental Behaviour of Radium" and "Environmental Behaviour of Polonium". In this quarter the first document was finalized for final editing and production, while the second was undergoing scientific editing. An IAEA consultancy meeting was held in Vienna during the week 20 to 24 February to progress writing of the third document.

OECD Nuclear Energy Agency (NEA) Radioactive Waste Management Committee (RWMC)

The 45th meeting of the OECD Nuclear Energy Agency (NEA) Radioactive Waste Management Committee (RWMC) was held at the OECD Conference Centre, Paris, from 22-23 March 2012. The RWMC was preceded by a meeting of the Regulators' Forum on 21 March 2012, also held at the OECD Conference Centre, Paris. A joint topical session was held with the Committee on Radiation Protection and Public Health on 23 March on timescales used in safety assessments for radioactive waste disposal.

Nuclear Energy Agency's (NEA) Committee on Radiation Protection and Public Health (CRPPH)

The CRPPH met at the OECD Conference Centre in Paris from 21-23 March. The CRPPH co-ordinates a number of programs in Radiation Protection and Public Health involving working parties including the working party on Emergency Management and various Expert Groups.

The program of the meeting included a Joint Discussion with the NEA Radioactive Waste Management Committee (RWMC) as referred to above.

Following the end of the emergency phase of the Nuclear Accident in Fukushima, Japan has drastically revised its requirements for the maximum allowable levels of radioactivity in food in response to community concern. The European Commission has indicated it is likely to follow Japan's lead. This may have implications for trade in relation to increased requirements for certification of exported foods.

31st Meeting of the IAEA Commission on Safety Standards (CSS)

The 31st Meeting of the IAEA Commission on Safety Standards (CSS) was held in Vienna from 27 to 29 March 2012. This was the first meeting of the fifth term of the CSS. Australia will also be represented on the CSS during its fifth term through the CEO of ARPANSA.

During the last term a range of Safety Requirements were completed covering all aspects of radiation protection, radioactive waste safety, transport and nuclear safety, including a major rewrite of the BSS; "Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards" (GSR Part 3 (Interim)).

The Safety Standards Committees and CSS have performed a 'gap analysis' of the whole suite of Safety Standards (SS), following the Fukushima accident. The overall conclusion from the exercise was that the SS provide a robust framework for safety. No gaps were identified in the overarching safety Requirements (*ca* 450). However, in total, 106 issues had been identified and more are likely when results of stress tests conducted internationally have been analysed.

ARPANSA maintains a high presence in the CSS/SS Committees and in the new Nuclear Security Guidance Committee. This involvement provides a main (albeit not the only) source of information regarding international best practice.

Promote the Effective Use of Radiation in Medicine

Radiotherapy Calibration Service

The radiotherapy calibration service, which supports the accuracy of radiation dose delivery in treatment centres, is currently based on the ARPANSA cobalt-60 gamma-ray source facility. This quarter, reference ionisation chamber calibrations for eleven 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.

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 conducted basic output audits of thirteen linear accelerators at four centres and completed final reports for four linacs at two centres audited in the previous quarter. Basic output audits have been conducted on a total of 41 linacs to date. In addition, pre-operational audits were conducted on four linacs at four centres.

Preparations for widespread implementation of the whole radiation field audit and end-to-end audit are progressing with field tests, the construction of additional mechanical components for the audits and the testing of a new Optically Stimulated Luminescence Dosimeter (OSLD) technology for dose measurement.

Australian Diagnostic Reference Levels (DRL) for Medical Imaging

The first cohort of national data for computed tomography (CT) diagnostic reference levels has been collected and analysed for publication. Data was obtained from 80 practices who submitted, either partially or in full, 346 scanning protocols covering 4930 individual scans. Preliminary DRLs have been calculated and submitted to the principle project stakeholder Royal Australian & New Zealand College of Radiologists. The survey is now collecting data for the calendar year 2012 and planning will start to develop further modules to cover the modalities of interventional radiology, mammography and nuclear medicine.

Work is complete on the estimation of the contribution of diagnostic imaging to the population dose of Australians. Extrapolation of the 2002 estimate, of 1.3 mSv per annum following trends in the growth of radiology services and similar dose per procedure in international studies indicates an increase of 27% to 1.65 mSv per annum. The increase is mainly caused by the growth in CT scanning.

Data collection has finished for the checking of calibration factors of Victorian nuclear medicine practice dose calibrators. Each nuclear medicine site will receive a report on their dose calibrator performance and data will be analysed for information that may be used to improve practice.

Protection of People from Natural Sources of Radiation

Measurement and Assessment

ARPANSA continues to participate in proficiency testing programs as part of its NATA accreditation. A proficiency test conducted by Proficiency Testing Australia for the analysis of potassium-40 samples was successfully completed.

ARPANSA continues the radioanalytical work for the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to analyse pre-digested samples. The samples are prepared by CSIRO and are part of on-going work until May 2012.

Following the Fukushima nuclear emergency in Japan ARPANSA has carried out measurements of samples for the screening of food samples from Japan as part of the Australian Quarantine and Inspection Service (AQIS) Imported Food Program. As contamination from the emergency reduces along with the likelihood of food contamination then the need for food sampling has also decreased.

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 24,300 workers from the uranium mining and milling industry.

ARPANSA has provided advice to the Department of Sustainability, Environment, Water, Population and Communities on the Environmental Review and Management Plan (ERMP) submitted by Toro Energy Limited under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to its proposed Wiluna Uranium Project. This advice has included an assessment of the proponent's response to the adequacy check performed by ARPANSA that identified key areas where insufficient detail was provided in the ERMP.

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 possible health effects from exposure to EMF and UVR exposure. Predominantly, enquires related to electric and magnetic fields from electrical power infrastructure, including the radiofrequency transmissions from smart meters but other sources such as mobile phone base stations and handsets, contribute significantly.

Officers from ARPANSA were invited by The House of Representatives Standing Committee on Infrastructure and Communications, to provide evidence to the inquiry into the Telecommunications Amendment (Enhancing Community Consultation) Bill 2011 on Friday 17 February 2012 in Parliament House. The officers provided information on ARPANSA's role and on the scientific basis of exposure standards.

ARPANSA also provided a submission to the Senate Inquiry into the Telecommunications Amendment (Mobile Phone Towers) Bill 2011.

ARPANSA continued to provide real-time UV Index data from 10 Australian sites and three Antarctic bases. The data is provided on the Internet and made available to mobile phone users through third-party applications. Protective strategies for avoiding excessive sun exposure are provided online.

Security of Radioactive Sources, and Emergency Preparedness

COAG Recommendations for Radiological Material

The National Register for High Activity Sealed Radioactive Sources 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, and has conducted a number of surveys of licence holder premises.

Training courses on the Transportation Security of Category 1, 2 and 3 radioactive sources has been delivered to all jurisdictions; refresher training programs in transportation security continues to be delivered as required.

ARPANSA and the Australian Safeguards and Non-Proliferation Office (ASNO) have established a joint Physical Protection & Security Review Working Group (PPS WG) in order to review the security arrangements of the OPAL Research Reactor. The PPS WG has met several times to develop and implement the review methodology in accordance with international best practice.

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.

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

Emergency Response Capability

ARPANSA provided response teams in readiness for nuclear powered warships visits to Australia 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 provide 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, Australia, including two noble gas analyser facilities, collocated with the air monitoring stations in

Melbourne and Darwin. The one remaining station is currently being assembled at Mawson, Antarctica.

In addition to operating the stations, ARPANSA also operates the Australian Radionuclide Laboratory, which has the role of testing samples obtained by other monitoring stations. Six samples were analysed during this quarter. The Laboratory operates under a contract to CTBTO.

Details of any Breach of Licence Conditions by a Licensee

No breaches were recorded during the quarter.

Facilities Licensed Under Part 5 of the ARPANS Act

No facilities were licensed during the quarter.

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 did not meet during the quarter.

Radiation Health Committee

The Committee met on 14-15 March 2012 at ARPANSA's Miranda office. A full summary of the meeting is available at: www.arpansa.gov.au/AboutUs/Committees/rhcmt.cfm. At the meeting, the Committee:

- Endorsed proposed actions for improving the management and progress of RHC projects, discussed the status of each current and proposed project and reviewed its work plan.
- Approved the draft *Safety Guide for the Use of Radiation in Schools: Part 2: Lasers* for publication and recommended that the CEO forward the draft to the Radiation Health and Safety Advisory Council for its recommendation on adoption of the Safety Guide.
- Endorsed a proposed project plan to re-establish a working group to consider options for improving safety of the use of IPLs and lasers for cosmetic purposes.
- Endorsed three recommendations for NDRP inclusions:
    - exemptions for certain lighting products
    - additional authorisation criteria for chiropractors
    - qualification/competency requirements for qualified experts as described in the Medical Code (RPS 14).

- Endorsed a proposed project plan to review the radiation incident reporting framework in Australia, subject to clarification of the project's objectives, and the inclusion of timeframes.

Nuclear Safety Committee

The Committee met on 1, 2 March 2012 at ARPANSA's Miranda office. A summary of the meeting is available at: www.arpansa.gov.au/pubs/nsc/nsc_1-2March12.pdf
At the meeting, the Committee:

- Received briefings on regulatory issues at ANSTO, including those related to the HIFAR reactor status, the OPAL reactor, ANSTO Health and ANSTO Life Sciences and progress with the Periodic Safety Review of OPAL
- was updated on the progress of ARPANSA's safety analysis Section
- received a briefing on the meeting of the Asian Nuclear Safety Network held in Korea in November 2011
- Received reports on ARPANSA activities generally and the International Regulatory Review Service follow up mission to ARPANSA in November 2011.

Report to the CEO from the RHSAC and NSC

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

Details of Directions Given by the Minister under Section 16

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 271 permits for medical radioisotopes including no urgent single shipments, 267 single shipments and 4 twelve monthly permits.

ARPANSA authorised officers also issued 151 permits for customs release of non-medical radioisotopes, comprising 58 urgent single shipments, 91 standard single shipments and 1 twelve monthly permit, with 1 cancelled permit.