



**Australian Government**

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**Australian Radiation Protection  
and Nuclear Safety Agency**

**QUARTERLY REPORT  
OF THE  
CHIEF EXECUTIVE OFFICER  
OF ARPANSA  
FOR THE PERIOD 1 JULY 2008 TO 30 SEPTEMBER 2008**





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and Nuclear Safety Agency**

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## Letter of Transmittal

3 November 2008

Senator the Hon Jan McLucas  
Parliamentary Secretary to the Minister  
for Health and Ageing  
Parliament House  
Canberra ACT 2600

Dear Parliamentary Secretary

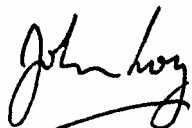
The *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act) requires the Chief Executive Officer of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) to submit to the Minister, at the end of each quarter, a report on:

- 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; and
- a list of 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 2008 to 30 September 2008.

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



**John Loy**

**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 three output groups:

- national leadership in radiation protection and nuclear safety;
- knowledge, information and services relating to radiation protection and nuclear safety; and
- regulation of Commonwealth entities using radiation sources and facilities or nuclear installations.

### **National leadership in radiation protection and nuclear safety**

#### ***Engagement with the Australian Government and national stakeholder bodies***

##### NATIONAL UNIFORMITY

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

During the quarter the following were highlights of this program:

- AHMAC endorsement of Amendment 1 (adoption of Codes and Standards) was under consideration.
- Amendment 2 (exclusions and exemptions) and Amendment 3 (adoption of the medical Code of Practice) were approved at the July 2008 RHC meeting and forwarded to AHMAC for endorsement.
- A draft amendment on the regulation of solaria was prepared, along with a draft regulatory impact statement (RIS). The draft RIS was forwarded to the Office of Best Practice Regulation for clearance. The draft and RIS will be released for public comment during the next quarter. ARPANSA is considering short-listed applications from consultants for proposals to develop a web-based training course for solarium operators.
- Additional amendments on user disposal of low level radioactive waste, use of lasers and intense pulsed light sources on humans have been prepared, and will be released for public comment when regulatory impact assessment has been completed.

Further detail can found in this report under operations of the Radiation Health Committee.

## AUSTRALIAN NATIONAL RADIATION DOSE REGISTER

The Minister for Resources, Energy and Tourism, the Hon Martin Ferguson AM MP, announced on 22 September the funding for the development of the Australian National Radiation Dose Register (ANRDR) to be undertaken by ARPANSA. The Dose Register will involve the collection, storage and auditing of radiological dose histories for uranium industry workers across Australia. The criteria by which the project will be deemed successful by stakeholders is detailed in a Memorandum of Understanding for the development, construction and implementation of the ANRDR between ARPANSA and the Department of Resources, Energy and Tourism. The ANRDR is due to be completed in late 2009.

The design and development of the ANRDR will rely on a uniform approach to dose estimate practices. Industry and regulatory consultation will provide the platform to scope the framework for a Safety Guide. In September, a Review Group was established and ARPANSA staff visited the Olympic Dam operation in South Australia on 3 September 2008 to gain a better understanding of industry practice.

## RADIOACTIVE WASTE MANAGEMENT FRAMEWORK

Newly developed provisions for the disposal of very low level radioactive wastes by small users were endorsed by the Radiation Health Committee during the quarter. Subject to regulatory impact assessment, the provisions will form part of the National Directory for Radiation Protection.

A safety guide for the predisposal management of radioactive waste has been completed and was approved for publication during the quarter by the Radiation Health Committee. The Radiation Health and Safety Advisory Council recommended the CEO of ARPANSA adopt the safety guide at their meeting on 8 August. The safety guide was posted on the ARPANSA website in September.

The IAEA Commission on Safety Standards approved the draft of the revised international safety standard DS390 "Classification of Radioactive Waste" during its 24th meeting held on 4 September. The revised standard is a significant revision of the 1994 international standard on waste classification and introduces a number of new concepts. ARPANSA played a significant role in the drafting of the document.

A draft of a new Australian scheme for radioactive waste classification "Classification and Operational Management of Radioactive Waste in Australia" has been prepared for presentation to the November meeting of the RHC. This new draft presents a cradle-to-grave scheme for all forms of waste in Australia. It is consistent with the new IAEA scheme, but deals with the Australian context in terms of the types of waste and storage and disposal options that will be available.

## NATIONAL BIODOSIMETRY WORKSHOP

A workshop on Australian capability for biodosimetry assessment was held at the Yallambie offices of ARPANSA on 12 August and attended by 18 representatives from research organisations, State and Commonwealth agencies. The workshop identified that a potential capability does exist within Australia but needs to be developed to meet the requirements of Australian radiation emergency medical response. A short report on the outcomes was provided to the Department of Health

and Ageing Chemical, Biological and Radiological meeting. A full report of the outcomes of the workshop is in preparation.

#### AUSTRALASIAN RADIATION PROTECTION SOCIETY (ARPS) ANNUAL CONFERENCE

A number of ARPANSA officers attended the ARPS annual conference in Canberra from 21 to 24 September. The Conference was attended by radiation safety officers and other radiation protection practitioners from industry, government and research bodies. ARPANSA presented a keynote address on "Ultraviolet Radiation Protection" at the conference. A list of the papers presented by ARPANSA is included in this report.

### ***Participation in international conferences and meetings***

#### IAEA GENERAL CONFERENCE

The CEO and the Director, Regulatory and Policy attended the 52<sup>nd</sup> General Conference of the IAEA that took place from 29 September to 4 October. Australia again led the negotiations for the safety resolution passed at the General Conference. A particular highlight of the week was a special event organised by Australia on the safety and regulation of uranium mining that was attended by a large number of delegates. A Scientific Forum during the Conference discussed the future of the IAEA, including with respect to its role in safety. The usual 'senior regulators' meeting' took place on the last day of the Conference. That meeting addressed the nuclear safety infrastructure required by a country considering the development of nuclear power and the application and future development of the IAEA safety standards.

#### COMMISSION ON SAFETY STANDARDS

The CEO attended a meeting of the IAEA Commission on Safety Standards from 3-5 September. The meeting further discussed the development of the IAEA safety standards and addressed the safety/security interface. The CSS approved several important new safety standards, including a Safety requirements on safety assessment and verification and safety Guides on borehole facilities for disposal of radioactive waste and the classification of radioactive waste.

#### CTBT WORKING GROUP

ARPANSA participated in the meeting of the Comprehensive Test Ban Treaty working group B in Vienna, Austria from 1 to 12 September. The meeting included: discussion of the work program and budget for 2009; review of the status of the commissioning of the International Monitoring System; and a report on the status of the deployment, testing and evaluation of the noble gas systems under the International Noble Gas Experiment. The working group noted that given the current environment, the International Monitoring System was well advanced in preparation for entry into force once the Treaty is ratified by all the required Members States.

#### INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION - COMMITTEE 4

An ARPANSA Branch Director participated in a meeting of Committee 4 of the ICRP in Dublin, Ireland from 8 to 12 September. Committee 4 advises the Main

Commission on application of the Commission's Recommendations. The Committee finalised advice on protection of populations during nuclear or radiological emergencies and advice on protection of populations living in contaminated territories after a nuclear accident or a radiological event. Advice in preparation regarding NORM, occupational exposure, protection principles for deliberate exposure for security and legal requirements, and the use of 'effective dose' and 'dose coefficients' were also discussed. The dose conversion coefficients for radon and the application of the Commission's recommendations to releases of radioactive material in the environment were also discussed.

#### INTERNATIONAL COMMISSION ON NON-IONIZING RADIATION PROTECTION (ICNIRP) WORKSHOP

An ARPANSA Branch Director participated in the ICNIRP workshop on basic radiation protection principles titled "15 Years On: Reviewing the Past and Looking Forward" on 15-16 September 2008 in Prague, Czech Republic. A paper titled "The different basic principles for non-ionising and ionising radiation (rationale, further developments, possibilities for harmonisation)" was presented. Some members of the ICNIRP extremely low frequency Task Group also met to discuss issues relating to finalising the draft ELF guidelines before review by the ICNIRP Commission in October 2008.

#### ASIAN NUCLEAR SAFETY NETWORK (ANSN) EMERGENCY PREPAREDNESS WORKSHOP

ARPANSA participated in a workshop and meeting in Bangkok Thailand from 22 to 26 September. The workshop dealt with requirements for preparedness and response for a nuclear or radiological emergency and the meeting was of the ANSN emergency preparedness and response topical group. The purpose of the meeting was to finalise Phase 1 activities of the topical group and to develop a mid-term plan for future activities. ARPANSA provided advice on Regional Competent Authority activities and sought to ensure consistency across the radiation emergency preparedness activities in the region. ARPANSA presented the Australian National Competent Authority Status Report which included discussion of the new ARPANSA Sharepoint Web Portal.

#### REGIONAL CO-OPERATIVE AGREEMENT (RCA) REGULATORS FORUM

ARPANSA participated in the RCA Regulators Forum meeting in Manila, Philippines from 5 to 7 August. The objective of the meeting was to re-assess the regional priorities and solutions previously identified, to review the action plan and discuss future interactions. Regional priorities for the sharing of information were reviewed and moderators were assigned for each priority topic. Priorities include: control of medical radiation exposure and incident reporting; unaccounted for radiation sources; environmental discharges; management systems and safety culture. Australia is to act as moderator on the topic of naturally occurring radioactive materials.

#### RADON POTENTIAL MAPPING WORKSHOP

ARPANSA participated in a radon potential mapping workshop in Oslo, Norway from 11 to 15 August to develop a better understanding of radon measurements, transport mechanisms and mapping techniques to benefit current and future health

physics programs. ARPANSA also visited the German radon calibration facilities at Federal Office for Radiation Protection BfS and at Physikalisch-Technische Bundesanstalt to further develop knowledge and compare calibration techniques.

#### ACCIDENT REPORTING AND GUIDANCE OPERATIONAL SYSTEM (ARGOS)

ARPANSA participated in the ARGOS Consortium meeting that took place from 8 to 10 September 2008 in Copenhagen, Denmark. The Australian ARGOS Evaluation Report was presented at this meeting.

ARPANSA visited the Centre for Environment, Fisheries and Aquaculture Science, UK Health Protection Agency (formerly NRPB), Atomic Weapons Establishment and Food Standards Agency from 12 to 17 September. At each Agency a paper was presented on the Australian Evaluation of ARGOS in order to develop international linkages to support emergency response preparedness capabilities.

#### BIENNIAL TECHNICAL MEETING OF INTERNATIONAL NUCLEAR EVENT SCALE (INES) NATIONAL OFFICERS

At the meeting held in Vienna, Austria from 1 to 4 July, the revised INES User's Manual was endorsed by the meeting based on the comments of participating countries. The new INES User's Manual consolidates assessment methods for evaluation related to nuclear facilities events, radiological events and events during transport.

#### ***International monitoring arrangements under the Comprehensive Test Ban Treaty (CTBT)***

As part of Australia's commitment to the CTBT, ARPANSA continued to operate and maintain radionuclide air monitoring stations at Melbourne, Perth, Townsville, Darwin, and the Cocos Islands, Australia. The two remaining stations to be installed to be located at Macquarie Island and Mawson, Antarctica. Recently, funding has become available, and negotiations with CTBTO for the installation of the Macquarie Island station have recommenced.

ARPANSA also operates and maintains a noble gas (NG) analyzer facility, collocated with the air monitoring station in Darwin. CTBTO has approved the installation of a further noble gas facility to be collocated with the Melbourne radionuclide station. Infrastructure works have begun in anticipation of an October 2008 installation.

ARPANSA continues to maintain a National Data Centre that provides advice to the Australian Safeguards and Non-Proliferation Office on any event detected by the CTBT radionuclide network that may be indicative of a nuclear weapon test explosion.

#### AUSTRALIAN RADIONUCLIDE LABORATORY

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. The Laboratory operates under contract to CTBTO.

## **Strengthening of regional capacities for emergency response**

### ACCIDENT REPORTING AND GUIDANCE OPERATIONAL SYSTEM (ARGOS)

The software system, ARGOS (*Accident Reporting and Guidance Operational System*) is a decision support system for chemical, biological, radiological and nuclear (CBRN) emergencies. ARPANSA completed a national project to evaluate the suitability ARGOS for Australian CBRN emergency planning. A workshop on the evaluation of ARGOS was hosted by ARPANSA in Melbourne on 13 August. The objective of the workshop was to discuss the results of the evaluation and to achieve a consensus on further Australian work on possible implementation of the ARGOS system. Among other recommendations, it was agreed that ARPANSA should continue the ongoing implementation of ARGOS as a tool to support Australian arrangements for nuclear and radiological emergency response.

### TRAINING OF TEAMS FOR MEDICAL RESPONSE TO RADIATION EMERGENCY

ARPANSA officers successfully completed specialised radiation emergency training provided by the US government. The officers achieved the highest grade and their proficiency was noted by the training providers.

### ARPANSA SHAREPOINT WEB PORTAL FOR REGIONAL COMPETENT AUTHORITIES

The web portal has been constructed on ARPANSA IT infrastructure and will commence operation in November.

## **Knowledge, information and services relating to radiation protection and nuclear safety**

### ***Study of science relevant to knowledge of health effects of radiation***

#### ELECTROMAGNETIC RADIATION (EMR)

ARPANSA has published results from its most recent program of measurements of electromagnetic energy levels around mobile phone base stations on its web site (<http://www.arpansa.gov.au/RadiationProtection/BaseStationSurvey/index.cfm>). The data published by ARPANSA are the results of actual measurements, taken by independent and accredited RF assessors. Measurements were taken around nine base stations, at distances ranging from 26 m to 830 m from the installation. At each base station measurements were made at five locations, including a location in a public area where the maximum exposure levels could be found. All locations had clear line-of-sight to the base station antennas and ARPANSA carried out extensive calculations and measurements to determine the measurement locations. Independent practitioners then performed measurements at the locations defined by ARPANSA. Funds provided by the mobile phone industry were used by ARPANSA to partially finance the program.

The base stations were chosen on the basis of public concern and not because of any scientific or technical indications that these base stations presented unusual risks. An attempt was made to include many different technologies and types of installation.

Measured exposure levels were in all cases well below the limits set in the *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz* (ARPANSA, 2002). The highest level found, adjusted to maximum telephone traffic conditions, was 50.4 mW per square metre, equivalent to 1.16% (or 1/86) of the ARPANSA RF exposure Standard. This adjusted exposure level is only expected to occur for brief periods each day, if at all. The maximum value of electromagnetic energy at this location actually measured, including contributions from other nearby base stations, was 0.27% (or 1/370) of the Standard. Locations closer to the base station and further away gave lower levels.

#### ULTRAVIOLET RADIATION

ARPANSA attended the Standards Australia Committee on Solaria meeting to consider and address the public comments (277 comments on 73 pages) as well as the Standards Australia Meeting on Sunscreens on the 22 August in Sydney. At that meeting, in response to issues regarding sunscreen testing addressed by the NZ Cancer Society, ARPANSA and the TGA, it was recommended by TGA that sunscreens should be tested and rated more conservatively.

ARPANSA attended the Ozone Science Group Meeting at the Bureau of Meteorology on 20 August to hear presentations by Dr Paul Fraser, Prof David Karoly and Dr Andrew Klekociuk AAD. The presentations examined ozone depletion over the Antarctic and the surrounding oceans over the last 20 - 30 years as well as looking at estimates of future trends. The interaction between ozone and ozone depletion and climate change was also discussed.

In terms of publication of UV exposure assessments, the following progress was made during the quarter:

- a collaborative study on the UVR occupational exposures of lifeguards with Emory University in the US has been internally reviewed and has been submitted to the American Journal of Industrial Medicine.
- proofs of the Chapter "Photoprotection by Fabrics" in the book "A Clinical guide to Sunscreens and Photoprotection" were finalised in September. Publication is due in December 2008.
- a collaborative paper with the Bureau of Meteorology and the CSIRO entitled "The 2007 Antarctic Ozone Hole" has been accepted for publication by the Australian Meteorological Magazine.
- a paper on the Validity of Self-Reported Sunscreen Use by Parents, Children and Lifeguards, done in collaboration with Emory University in the US has just been accepted for publication in the December 2008 issue of the American Journal of Preventive Medicine.
- ARPANSA refereed a paper on Vitamin D and UVR for a journal in the US.

#### HEALTH PHYSICS

A radiological survey was conducted of the former ABC Towong site and the existing Mt Coot-tha site. External dose and radon concentration were assessed inside the building on all levels using passive dosimeters placed out for 3 months from July to September. A report is pending.

A radiological assessment and inspection of the CSIRO Radiation Waste Store at Woomera, South Australia was conducted on 3 September 2008. The low radon-222 levels measured during this visit indicate that ventilation within the store is adequate to maintain levels below the action levels in the workplace of 1000 Bq/m<sup>3</sup>. Comparison of the gamma dose rates around the perimeter and inside the store were below occupational limits (20 mSv) given limited access.

The Radon Calibration Laboratory service was suspended in June to upgrade electronics to resolve a noise problem. The service continues to be out of service and is on track to be re-activated in the fourth quarter of 2008.

#### ENVIRONMENTAL RADIOACTIVITY

A project has commenced to investigate a method for determining low levels of polonium in fish and tinned sea-food. Ultimately the aim is to estimate the typical range of doses to the Australian population from ingestion of polonium-210 in sea food.

### ***Scientific programs to support the measurement and assessment of radiation (ionizing and non-ionizing)***

#### SURVEYS OF PATIENT DOSES

A retrospective survey has been sent out to gather the mammography mean glandular dose data on all mammography systems that have passed RANZCR/ACPSEM mammography certification testing in the last 2 years. These data will be used to generate a generic Diagnostic Reference Level (DRL) for the accreditation imaging phantom across the three mammography modalities – film/screen, CR and flat panel.

ARPANSA is project managing a Computed Tomography (CT) dose optimisation survey in Queensland with RANZCR QUDI program, Queensland Health and the ACPSEM. The survey is using a web based data collection protocol that, if successful, could be adapted for the ARPANSA national CT survey.

A project has been initiated to assess the performance characteristics of Gafchromic film for personal radiation dosimetry. The responses of the film to dose linearity, energy response, fading, dose accuracy are being evaluated. A new digitisation scanner has been purchased and is being evaluated.

#### IONIZING RADIATION STANDARDS

An application has been made to the CEO of ARPANSA for approval under Regulation 51 to acquire a 130 TBq cobalt-60 source. The old cobalt-60 source will need to be returned to ANSTO in the existing housing and in a suitable overpack for transportation. The overpack being considered has been used before for a similar transport within Australia, but will require approval for this purpose.

A prescribed radiation facility licence to operate the new ARPANSA medical standards linear accelerator has been granted, allowing the installation of the linac to proceed. Preparation for the delivery of the Elekta Synergy linac facility has continued with minor works to install rails for a measurement table and plumbing for chiller services. A dose mapping system has been delivered and is being validated. Delivery of the accelerator is scheduled for early October.

In the therapy dosimetry audit program, audit reports have been completed and delivered to three radiotherapy providers – Royal Prince Alfred Hospital (Camperdown), Premion (previously the Wesley Oncology Centre, Albion), and Radiation Oncology Victoria (Melbourne). One energy per linac, for a total of 8 beam outputs, was audited for these centres. There are currently three more centres participating at various stages of completion.

There were 31 calibrations during the quarter including 11 for therapy reference dosimeters, 9 for electrometers and 7 for Gamma/Beta survey meters. There has been a roughly three-fold increase in the number of therapy level calibrations in the September quarter due to the anticipated replacement of the current teletherapy cobalt-60 source in December 2008. Centres were notified to schedule their calibrations as early as possible before late October when the existing source would be demounted. Calibrations at cobalt-60 energy are not likely to resume for several months while the new source is being characterised and reference standards re-established.

#### RADIOPHARMACEUTICAL QUALITY ASSURANCE

Discussions have been held with the RMIT/Peter MacCallum Cancer Centre Medical Radiations Research Group on collaborative projects in the radiopharmaceutical/nuclear medicine field.

#### ***Personal radiation monitoring service***

The ARPANSA PRMS has continued to offer a comprehensive radiation monitoring service for persons who may be exposed to ionizing radiation as a consequence of their occupation. A service is also provided for the measurement of radon and natural background radiation levels.

#### ***UV protection factor rating for clothing***

The UPF Testing Service at ARPANSA, which tests and rates the UVR protection provided by clothing, has undertaken a large International intercomparison of UPF testing within Australia and from overseas. The study, which examined instrument performance and measurement uncertainties should be analysed and ready for publication by the end of 2008. The UPF swing tags were recently redesigned. The messages on Sun Protection from the Australian Cancer Society and the New Zealand Cancer Society have been updated and additional ARPANSA related activities and information have been added. More than 5 million tags are issued annually. The Service has also commenced issuing reports on the UVR protection provided by shade cloth. A scheduled assessment by NATA occurred in June 2008 and continuing accreditation was approved.

#### ***Information through written material***

##### ARPS PAPERS

Papers presented at the Australasian Radiation Protection Society Conference, held in Canberra from September 21-25, 2008:

Grzechnik, G., Tinker, R. A, Solomon, S., *Cross-Governmental Evaluation of the ARGOS Radiological Protection and Modelling Tool for Use in Australia*. Australasian Radiation Protection Society Conference, Canberra, 21-24 September (2008).

Grzechnik, G., *Modelling Radiological and Chemical Releases from the Atmospheric Re-Entry of Satellite US-193*. Australasian Radiation Protection Society Conference, Canberra, 21-24 September (2008).

Karpidis K & Martin LJ, *Survey Of Residential Power Frequency Magnetic Fields In Melbourne, Australia*, Australasian Radiation Protection Society, Annual Conference, Canberra, 21 -24 September (2008).

Tinker, R. *A Uniform Approach for the Management of Radiation Dose in the Uranium and Mining and Milling Industry*. Australasian Radiation Protection Society Conference, Canberra, 21-24 September (2008).

O'Brien, R.S., Waggitt, P.W., McDonald, P., Horyna, J., Koukouliou, V., Perez Sanchez, D., Setlow, L.W., Yu, C., Zeevaert, T., Olyslaegers, G., Quintana, E., Canoba, A., Amado, V., Sitnikov, S., Al-Khayat, T., Paganini, M., Nuccetelli, C., *Environmental Modelling for Radiation Safety*. Australasian Radiation Protection Society, Annual Conference, Canberra, 21 -24 September (2008).

O'Brien, R.S., Woollett, S.M., *Assessing the impact of I-131 discharges to sewer systems - modelling the effect of holding tanks*. Australasian Radiation Protection Society, Annual Conference, Canberra, 21 -24 September (2008).

Melbourne, A.J., O'Brien, R.S., *Development of Guidance on Naturally Occurring Radioactive Material (NORM) in Australia*. Australasian Radiation Protection Society, Annual Conference, Canberra, 21 -24 September (2008).

#### OTHER PUBLICATIONS

ARPANSA Technical Report 149: *Environmental Radioactivity Monitoring in Australia 2005 and 2006*

ARPANSA Technical Report 148: *The Radioactive Content of Some Australian Drinking Waters*.

Martin L.J., & Henderson S.I., *Radiofrequency Measurements of Mobile Phone Base Stations for Addressing Public Concern*, Edited Conference Proceedings, International EMF Conference 2007, Editors Kwan-Hoong Ng, Noel D Montgomery, Li-Kuo Tan, pp 51-54.

#### **ARPANSA website**

In the reporting period there were 169,957 visits to the ARPANSA website. The most popular web pages were radiation and health information sheets.

Visitors downloaded 64,681 documents predominantly from the ARPANSA Radiation Protection series which can be found at: <http://www.arpansa.gov.au/Publications/codes/rps.cfm>. The most frequently downloaded single document was the Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (2002).

## Regulation of Commonwealth entities using radiation sources and facilities or nuclear installations material, apparatus and facilities

### *Regulatory activities*

ARPANSA regulatory staff continued the program of inspection of licensed radiation sources and facilities with results as detailed below.

#### INSPECTIONS - UNANNOUNCED

Licensee	Licence Number	Location
ANSTO – HIFAR (24/07/08)	FO0044-4A	Lucas Heights ANSTO site - HIFAR
ANSTO – OPAL (20/08/08)	F0157	Lucas Heights ANSTO site - OPAL
ANSTO – OPAL (10/09/08)	F0157	Lucas Heights ANSTO site - OPAL
ANSTO – HIFAR (18/09/08)	FO0044-4A	Lucas Heights ANSTO site - HIFAR

#### INSPECTIONS - ANNOUNCED

Licensee	Licence Number	Location
Australian Customs Service	F0131	Container examination facility, Melbourne, Vic
Australian Customs Service	F0187	Brisbane neutron scanner, Brisbane, Qld
Australian Defence Force and Department of Defence	F0166	Linear accelerator, Woomera, SA
Australian Customs Service	S0092	Pallet x-ray unit, Melbourne, Vic
Australian National University	S0027	Faculty of Science, Canberra, ACT
Australian National University	S0027	Research School of Chemistry, Canberra, ACT
Australian National University	S0027	Research School of Earth Sciences, Canberra, ACT
CSIRO Corporate Property Services	S0013	CSIRO Rangehead, Woomera, SA
CSIRO Energy Technology	S0025	National Solar Energy Centre, Newcastle, NSW
Australian Defence Force and Department of Defence	S0042	Defence Science and Technology Organisation, Edinburgh, SA
Silex Systems Limited	S0090	Lucas Heights, NSW
ANSTO Fuel Operations	FO0044-4C	Buildings 17B, 23C and 41, LHSTC

Licensee	Licence Number	Location
ANSTO Waste Operations and Technology Development	FO0044-WOTD	Buildings 20B, 57A, B59A, B59B and Hut 36

INSPECTION REPORTS ISSUED

Licensee	Report number	Inspection
Australian Customs Service	R08/09751	Brisbane neutron scanner, Brisbane, QLD
Australian Customs Service	R08/07032	Pallet x-ray facility, Osborne, SA
Australian Customs Service	R08/04122	Brisbane pallet x-ray facility, Fisherman's Island, QLD
Australian Federal Police	R08/07847	Adelaide airport and Currie Street Offices, Adelaide, SA
Australian National University	R08/07530	Heavy ion accelerator, ANU, ACT
Australian National University	R08/07514	Rutherford backscatter accelerator and high energy implanter, ANU, ACT
Australian War Memorial	R08/02549	AWM annexe, Canberra, ACT
CSIRO Exploration and Mining	R08/03941	Queensland Centre for Advanced Technologies, QLD
CSIRO Minerals	R08/02629	Clayton, Vic
Australian Defence Force and Department of Defence	R08/07821	Special Air Services Regiment, Campbell Barracks, WA
Department of Foreign Affairs and Trade	R08/07355	Canberra, ACT
ANSTO Radiopharmaceutical Research Institute	F0044-5A, 5B, 5C	Buildings 19 and 76 Research & Development, LHSTC
ANSTO Institute of Environmental Research	F0134	2MV STAR Accelerator, LHSTC
ANSTO Institute of Environmental Research	F0044-6Ba	14 MV ANTARES Accelerator, LHSTC
ANSTO Institute of Environmental Research	F0044-6Bb	3MV Van de Graaff Accelerator, LHSTC
ANSTO - OPAL	RB-INS-R08/10237	Unannounced inspection of OPAL Logbook records

REGULATION 51 REQUESTS FOR APPROVAL (RECEIVED)

Licensee	Number	Type	Comment
ANSTO Bragg Institute	S0202	Source	Request to amend source licence S0202 for KOWARI and KOALA to cover operation without limitations
ARPANSA Medical Radiation Branch	F0046	Facility	Request for approval to replace teletherapy source
ANSTO- Waste Operations and Technology Development	FO0044-WOTD	Facility	Modification of facility to include new Nuclear Material Store, Building 61
ANSTO - OPAL	F0157	Spent Resin Transport Flask	E0071 - received on 15/07 (awaiting ANSTO response to ARPANSA formal questions)
ANSTO - OPAL	F0157	Uranium Targets	E0081 - Uranium Target Submission – received on 15/07 (Approved on 17/09)
ANSTO - OPAL	F0157	Operational Limit and Conditions	E0014 – OLC on Flap Valve Opening - received on 18/07
ANSTO - OPAL	F0157	Plant Procedures	O0001 – Plant Procedure – Reactor Refuelling and Main Control Room Evacuation – received on 18/07 (awaiting ANSTO response to ARPANSA formal questions dated 25/09)
ANSTO - OPAL	F0157	Plant Procedures	O0006 – Plant Procedure – Shutdown to Power and Shutdown to Physics State – Field Operations – received on 18/07

REGULATION 51 APPROVALS

Licensee	Number	Type	Comment
ANSTO Bragg Institute	S0171	Source	Request to amend source licence S0171 to cover operation of WOMBAT and ECHIDNA without limitations was approved
Australian Defence Force and Department of Defence	F0166	Facility	Approval given to temporarily relocate linear accelerator
ANSTO - OPAL	F0157	Containment Energy Removal System	E0051, Modification of TRICON Logic, approved on 1/08

Licensee	Number	Type	Comment
ANSTO - OPAL	F0157	Containment Energy Removal System	E0092, Modification of TRICON Logic, approved on 1/08
ANSTO - OPAL	F0157	Uranium Targets	E0081 – Uranium Target Submission, approved 17/09

ISSUED OR AMENDED LICENCES

Licensee	Number	Type	Comment
ANSTO Bragg Institute	S0202	Source	New source licence S0202 issued to allow operation of WOMBAT and ECHIDNA without limitations
ANSTO Bragg Institute	S0202	Source	Source licence S0202 amended to allow operation of KOALA and KOWARI without limitations
ANSTO Ore Processing Operations Facility	F0044-7A	Facility	Facility licence F0044-7A amended to allow disposal by return of controlled material samples to their owners without prior approval, but to be reported quarterly instead
ANSTO Institute of Environmental Research	F0200	Facility	Licence issued to decommission the 3MV Van de Graaff Accelerator
Pet Net Australia Pty Ltd	F0201	Facility	Licence issued to construct two prescribed radiation facilities (medical cyclotrons)
ANSTO Institute of Environmental Research	F0044-6Bb	Facility	Licence surrendered on 24 September 2008
ANSTO Fuel Operations	F0044-4C	Facility	Licence surrendered on 23 September 2008, page 4 of 57.
Australian War Memorial	S0080	Source	Licence amended to include dealing with laser apparatus
Australian Defence Force and Department of Defence	F0084	Facility	Facility licence F0084 amended to reflect current store contents and to update the licence format
Department of Health and Ageing , Mersey Hospital, Tasmania	S0191	Source	Licence surrendered
ANSTO – HIFAR	F0184	Facility	Possess or Control the Nuclear Installation issued on 15/09/08.

### MOATA (FACILITY LICENCE F0044-6A)

ANSTO reported on the period April-June 2008. ANSTO has commenced planning and preparations for the final decommissioning of the MOATA reactor. The analysis of drilled samples taken from MOATA showed the activation profile and isotopic content of the structure. It appears that the activation depth of the concrete is lower than previously predicted by calculations. This may result in a reduced volume of radioactive waste. The remaining two sources (a Pu-Be neutron source and a fission chamber containing small amount of U-235) were removed from the reactor.

### HIFAR (FACILITY LICENCE F0184)

The CEO of ARPANSA issued a facility licence authorising ANSTO to possess and control the HIFAR facility, on 15 September 2008. The purpose of the facility licence is to place the HIFAR facility in a state of safe enclosure prior to preparation for eventual decommissioning.

The facility licence is subject to a number of licence conditions; in particular ANSTO must obtain the CEO of ARPANSA's prior approval before undertaking any dismantling of structures, systems or components.

### OPAL (FACILITY LICENCE F0157)

#### *Abnormal Occurrences*

During the quarter there were a total of four events recorded for the OPAL reactor. None of them had any safety significance and all were assessed by ANSTO and ARPANSA to be Level 0 on the International Nuclear and Radiological Event Scale.

#### *Facility Modifications*

In July ARPANSA observed the modification of 20 fuel assemblies which was undertaken at OPAL by personnel of the fuel manufacturer (CERCA of France). ARPANSA was satisfied with the conduct of this modification which brought the fuel assemblies in line with the modified design that had previously been approved by the CEO of ARPANSA.

#### *Airborne Discharges*

As indicated in the OPAL quarterly reports for April-June 2008, received in this current quarter, airborne discharges from OPAL were well within the Quarterly Notification Levels for that period

### LICENCE EXEMPTION

The CEO of ARPANSA granted an exemption from the requirement to obtain a licence authorising the preparation of a site for and the construction of a prescribed radiation facility (a medical LINAC) at the Yallambie premises of ARPANSA. The exemption was given under Regulation 37.

### TRANSPORT OF RADIOACTIVE MATERIAL

The CEO of ARPANSA, as the competent authority under the *Code of Practice for the Safe Transport of Radioactive Material* (ARPANSA, 2008)<sup>1</sup> for transport of radioactive material by road and rail received the following requests for validation of the original certificates:

- Certificate of Competent Authority Special Form Radioactive Materials Certificate Number USA/0696/S-96, Revision 3
- Competent Authority Certificate for A type Fissile Radioactive Materials Package Design Certificate USA/9329/AF-96, Revision 1

The assessment of submissions is being finalised.

#### 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 also issued 170 permits for medical radioisotopes including 7 urgent single shipments, 152 single shipments and 11 twelve month permits. ARPANSA authorised officers also issued 141 permits for customs release of non-medical radioisotopes, comprising 79 urgent single shipments, 58 standard single shipments and 4 twelve monthly permits.

#### EXPORT PERMITS

The export of high activity radiation sources from Australia requires permission under Regulation 9AD of the *Customs (Prohibited Export) Regulations 1958*. These regulations are made under the *Customs Act 1901*. Under the *Customs (Prohibited Export) Regulations 1958*, the Minister for Health and Ageing may authorise ARPANSA officers to approve export permissions.

In accordance with the authorisation by the Minister for Health and Ageing under the *Customs (Prohibited Import) Regulations 1958*, ARPANSA authorised officers issued two export permissions during the quarter.

### ***Regulatory process and performance***

#### QUALITY MANAGEMENT

ARPANSA is revising and improving the regulatory quality management system to ensure that the regulatory processes are managed according to a comprehensive quality management system which meets the ISO 9000 standard.

A quality committee is in place and is meeting each month to ensure suitable progress of this review. Significant progress has been made with the development and documentation of the Scope of Services and Management of Services documents, identification and development of policies and procedures that require updating and plans to scope and finalise the complete review program.

#### REGULATORY KEY PERFORMANCE INDICATORS

Throughout 2007/2008, ARPANSA has reported its progressive regulatory performance against the KPI's developed in its business plan at the beginning of that year.

As planned from the outset these indicators have now been revised taking into account the first year of experience with their use. This revision has resulted in the addition of some more activity measures in more specific categories, the removal of some indicators which were not considered sufficiently useful and the revision of some of the targets in light of the year's performance.

The regulatory Management Information System is currently being revised to allow more accurate and complete collection of data against these new KPI targets.

The revised KPI targets and the performance against these for this first quarter of the 2008/2009 year is as follows:

**PROGRESS AGAINST KPI'S 2008/2009**

Measure	September 08	Annual Target <sup>a</sup>
Accidents/incidents that must be reported within 24 hours	1	< 5
Incidents that are not accidents	0	< 40
Number of inspection and assessment reports per staff member (14 inspectors)	2.7	> 7
Breaches - Unlicensed	0	< 5
Breaches – Failure to comply with licence conditions	8	< 20
Announced Inspections	13	> 50
Unannounced Inspections	4	> 10

Notes

- a. The annual targets were derived based by estimation only. They will be progressively refined over time as actual data is collected and trends can be determined.

## Details of any breach of licence conditions by a licensee during the quarter, of which the CEO is aware

### BREACHES DETERMINED BY THE CEO

Licensee	Number	Nature of breach	Action
ANSTO	S0045	S31(2) of the ARPANS Act – failure to comply with licence conditions (Disposal of an X-ray unit without prior approval -Regulation 53(1) of the ARPANS Regulations)	No enforcement action taken
CSIRO Sustainable Ecosystems	S0018	S31(2) of the ARPANS Act – failure to comply with licence conditions (Late submission of Quarterly Report)	No enforcement action taken
CSIRO Industrial Physics	S0105	S31(2) of the ARPANS Act – failure to comply with licence conditions (Disposal of an controlled apparatus without prior approval -Regulation 53(1) of the ARPANS Regulations)	Submission made to rectify breach. No enforcement action necessary
CSIRO Industrial Physics	S0105	S31(2) of the ARPANS Act – failure to comply with licence conditions (Class 4 laser not fitted with an appropriate radiation warning sign)	Submission made to rectify breach. No enforcement action necessary
CSIRO Molecular and Health Technologies	S0016	S31(2) of the ARPANS Act – failure to comply with licence conditions (Inventory of sources not maintained)	Submission made to rectify breach. No enforcement action necessary
CSIRO Molecular and Health Technologies	S0016	S31(2) of the ARPANS Act – failure to comply with licence conditions (Non-ionising apparatus not fitted with appropriate warning labels)	Submission made to rectify breach. No enforcement action necessary
Australian Defence Force and Department of Defence	F0084	S30(2) of the ARPANS Act – failure to comply with licence conditions (Failure to meet time related licence conditions).	Submission made to rectify breach. No enforcement action necessary
Australian Defence Force and Department of Defence	F0084	S30(2) of the ARPANS Act – failure to comply with licence conditions (Failure to follow own plans and arrangements for managing safety at Woomera store)	Submission made to rectify breach. No enforcement action necessary

## **A list of all facilities licensed under Part 5 of the *ARPANS Act***

<b>Licensee</b>	<b>Number</b>	<b>Type</b>	<b>Comment</b>
Pet Net Australia Pty Ltd	F0201	Facility	Licence issued to construct two prescribed radiation facilities (medical cyclotrons)
ANSTO – HIFAR	F0184	Facility	Possess or Control the Nuclear Installation issued on 15/09/08.

# 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 Melbourne office on 8 August 2008. A summary of Council's meeting is available on the ARPANSA web site at <http://www.arpansa.gov.au/AboutUs/Committees/rhsacmt.cfm>.

Outcomes of the meeting were:

- Finalisation of the Council's report on the review of the effectiveness and efficiency of the National Directory for Radiation Protection
- Review of Council draft advice on Management and Disposal of Longer-Lived Intermediate Level Radioactive Waste (LLILW)
- Council subsequently provided its report on LLILW to the CEO on 24 September 2008.
- Council recommended that the CEO adopt the following five Safety Guides:
  - Safety Guide on Management of Naturally Occurring Radioactive Material (NORM)*
  - Safety Guide on Radiation Protection in Interventional and Diagnostic Radiology*
  - Safety Guide on Radiation Protection in Nuclear Medicine*
  - Safety Guide on Safe Transport of Radioactive Material*
  - Safety Guide on Predisposal Management of Radioactive Waste*

## Radiation Health Committee

The Committee met on 16 and 17 July 2008 at ARPANSA's Yallambie offices. A summary of the meeting is available at <http://www.arpansa.gov.au/AboutUs/Committees/rhcmmt.cfm>.

The outcomes of the meeting were:

- the Committee voted in favour of the inclusions in the National Directory for Radiation Protection of Amendment 2, which adds further clarifying detail to the exclusion and exemption provisions, and also Amendment 3 to adopt the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* (RPS 14).
- the Committee approved the draft amendment on the regulation of solaria to be released for public comment, subject to completion of the draft RIS.
- the Committee approved each of the final drafts of the *Safety Guide for Radiation Protection in Diagnostic and Interventional Radiology* and the *Safety Guide for Radiation Protection in Nuclear Medicine* for publication and recommended that the CEO forward the drafts to the Radiation Health and Safety Advisory Council (RHSAC) for its recommendation on adoption of each Safety Guide.

- the Committee agreed to the establishment of a panel in response to a proposal from the Chair to the Royal Australian and New Zealand College of Radiologists (RANZCR) for a joint RHC/RANZCR Radiology Liaison Panel to discuss a range of issues relating to radiological practice, including to the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation*
- the Committee decided that work on the draft Code to cover chiropractic X-ray procedures should be deferred until a satisfactory draft RIS had been developed.
- the Committee approved the final draft of the *Safety Guide for the Safe Transport of Radioactive Material 2008* for publication and recommended that the CEO forward the draft to the RHSAC for its recommendation on adoption.
- the Committee agreed that although it had not proved possible to meet the timetable outlined at the forum held in February 2008 for the development of the draft ELF Standard, the proposed processes were being followed.
- the Committee approved a final draft of the *Safety Guide for the Management of Naturally Occurring Radioactive Material (NORM)* for publication and recommended that the CEO forward the draft to the RHSAC for its recommendation on adoption.
- the Committee agreed that a revised draft of the ionizing radiation part of the Safety Guide for the use of radiation in schools should be released for public comment. The draft was released on 7 August 2008 for a period of public consultation until 3 October 2008.
- the Committee decided to establish a working group to develop core competencies with Government Skills Australia for the incorporation of radiation protection into the national vocational education and training system
- the Committee agreed on the need to review and in some cases replace the remaining Radiation Health Series Codes
- the Committee decided that a Statement should be developed to assist crematorium and funeral parlour workers in the safe handling of corpses containing radioactive material and to replace NHMRC RHS 18, *Code of Practice for the Safe Handling of Corpses Containing Radioactive Materials (1986)*.
- the Committee was informed that the Commonwealth Government's newly announced "one in-one out" policy for new regulation would impact on the development process for codes and standards.

## **Nuclear Safety Committee**

The Nuclear Safety Committee did not meet during the quarter. The next meeting is scheduled for 17 October 2008.

## **Reports to the CEO from the RHSAC and NSC (paragraphs 20(f) and 26(1)(d) of the Act)**

The Council report on Management and Disposal of Longer-Lived Intermediate Level Radioactive Waste was provided to the CEO on 24 September 2008.

## **Details of directions given by the Minister under Section 16**

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