

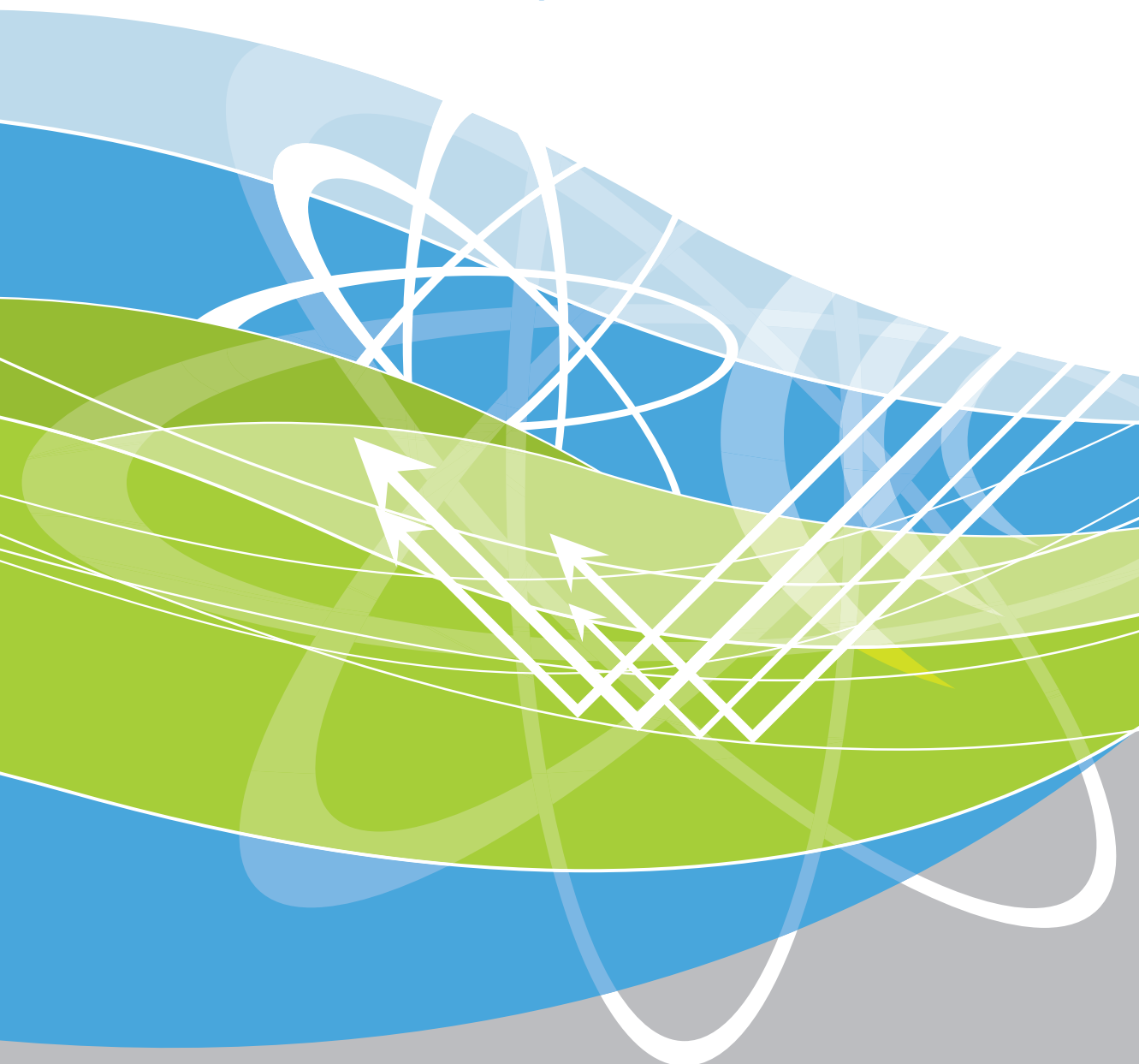


Australian Government

Australian Radiation Protection and Nuclear Safety Agency

# ARPANSA

Annual Report of the Chief Executive Officer



ANNUAL REPORT 2008-09



**Annual Report of the  
Chief Executive Officer of ARPANSA  
2008-09**



# Australian Radiation Protection and Nuclear Safety Agency

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## Australian Government

### Australian Radiation Protection and Nuclear Safety Agency

11 September 2009

The Hon Mark Butler MP  
Parliamentary Secretary for Health  
House of Representatives  
Parliament House  
CANBERRA ACT 2600

Dear Parliamentary Secretary

In accordance with section 59 of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the ARPANS Act), I present to you for transmittal to the Parliament the Annual Report of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) for the period 1 July 2008 to 30 June 2009.

As required by the ARPANS Act, my report provides details on:

- the operations of the CEO, ARPANSA and the Council and Committees
- any direction given by the Minister to me under section 16 of the ARPANS Act and any breach of licence conditions by a licensee, of which I am aware
- all reports received from the Radiation Health and Safety Advisory Council on matters related to radiation protection and nuclear safety or the Nuclear Safety Committee on matters related to nuclear safety and the safety of controlled facilities.

The report of the independent auditor on the financial statements of ARPANSA for 2008-09 and the financial statements are included with this report which also meets the Requirements for Departmental Annual Reports issued by the Department of the Prime Minister and Cabinet and updated 17 June 2009.

Yours sincerely

Acting CEO of ARPANSA

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## ***Part 1: Review by the CEO***



This is the eleventh Annual Report of the CEO of ARPANSA. During the year Dr John Loy resigned as CEO of ARPANSA, having been ARPANSA's first CEO and remained in that position for ten years. Senator The Hon Jan McLucas, Parliamentary Secretary to the Minister for Health and Ageing, having Ministerial responsibility for ARPANSA appointed me as Acting CEO of ARPANSA on 28 November 2008. On 6 June 2009 it was announced that The Hon Mark Butler would replace Senator McLucas as Parliamentary Secretary.

## Major Achievements

ARPANSA has continued to contribute to maintaining the high standard of radiation protection and nuclear safety in Australia by providing advice, by the preparation of national uniform standards and by regulation of Australian Government entities. In particular priority was given to the following areas for the year 2008-09:

- Further adoption of the optimisation principle in diagnostic medicine and therapeutic treatments.
- Continuing to highlight the harmful effects of excessive exposures to ultraviolet radiation (UVR).
- Monitoring and advising on population exposures to extremely low frequency electric and magnetic fields (ELF, EMF) and electromagnetic radiation.
- Assuring the security of radioactive sources in Australia and strengthen Australia's capability to respond to radiation emergencies.

The principal outcomes highlighted in this report are the:

- Publication of three safety guides during the year on medical applications of radiation: diagnostic and interventional radiology, nuclear medicine and radiotherapy.
- Installation and commissioning of a state-of-art medical linac for calibrating radiotherapy doseimeters.
- Assessment of UVR exposures for high risk groups, such as young children and outdoor workers.
- The completion of detailed surveys of exposures from residential magnetic fields and mobile telephone base stations.
- Enhancement of radiation protection for workers involved in uranium mining.
- Modification of the Australian Radiation Protection and Nuclear Safety Regulations 1999 to add security requirements for hazardous radioactive sources.
- Delivery of training programs for the implementation of the *Code of Practice on the Security of Sources* for State and Territory regulators.

## Medical Radiation Code of Practice

The Medical Radiation Branch has continued to work with the medical professions to ensure the most effective use of ionizing radiation in diagnostic medicine and in therapeutic treatments, and that the best outcomes are achieved for patients.

I am pleased to be able to report that, following the publication of the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* in May 2008, the *Safety Guide for Radiation Protection in Diagnostic and Interventional Radiology* and the *Safety*

*Guide for Radiation Protection in Nuclear Medicine* were published on 27 August 2008, and that the *Safety Guide for Radiation Protection in Radiotherapy* was published on 19 December 2008. The code of practice is a single regulatory document that sets out the regulatory requirements for medical radiation practices, whilst the three safety guides are best practice guides specifically dealing with radiation protection in each of the three major medical radiation modalities of diagnostic and interventional radiology, nuclear medicine and radiotherapy.

A requirement of the code of practice is that radiation doses administered to patients for diagnostic purposes are recorded and periodically compared with Diagnostic Reference Levels (DRLs) for diagnostic procedures for which DRLs have been established in Australia. ARPANSA and the Royal Australian and New Zealand College of Radiologists have set up a Radiology Liaison Panel to work to develop DRLs for diagnostic radiology.

## **Medical Linear Accelerator (Linac)**

As foreshadowed in the 2007-08 Annual Report, an Elekta Synergy Platform, medical linac was delivered to ARPANSA in October 2008. Commissioning and acceptance testing of the linac continued through January 2009 with final acceptance on 9 February 2009. A formal launch ceremony was held on 13 February 2009 and the facility was visited by the Parliamentary Secretary for Health and Ageing at the end of March.

The ARPANSA medical linac has been specially fitted with an extended range of megavoltage X-ray and electron beam energies. ARPANSA visited the

National Physics Laboratory (UK) in early November 2008 to gain and share experience on the installation and acceptance testing of the NPL Elekta linac, which is matched with the ARPANSA linac and will facilitate intercomparisons of direct megavoltage dosimetry methodologies.

## **Ultraviolet Radiation – Measurement and Personal Exposure**

Measurements of solar ultraviolet radiation (UVR) in Australia and Antarctica through the ARPANSA network have continued and data reliability has been maintained at approximately 95%. The provision of ARPANSA UVR measurement data has been further expanded and real time data is now provided on the internet for Melbourne, Sydney, Darwin, Adelaide, Brisbane, Townsville, Newcastle, Kingston (outside Hobart) and Perth. It is planned to have real-time UVR data from the Australian Antarctic Stations at Casey, Davis and Mawson on the ARPANSA website by late 2009. New dataloggers incorporating 3G modems are being developed for installation at Bureau of Meteorology sites at airports. The new spectral measurement system acquired in 2008 is now installed and has been operating daily in the rooftop laboratory in Melbourne since December 2008. This new system provides continuously calibrated UVR measurements to allow regular calibrations of the UVR detectors used in the solar UVR measurement network.

ARPANSA has been involved in numerous collaborations with research groups in Australia and overseas, resulting in 16 different UVR exposure study publications.

Over recent years studies have focussed on high risk groups, such as young children and outdoor workers. Young children are particularly important, given that UVR exposures in early life are crucial and can lead to the development of skin cancers and higher skin cancer rates later in life, while outdoor workers can receive very high solar UVR exposures.

In order to develop strategies to reduce UVR exposure it is important to understand current behaviour patterns. A number of studies were published dealing with sun protective behaviour for parents, children and lifeguards, the validity of self-reported exposure and sunscreen use. Results indicated that 39% of lifeguards received more than four times the occupational UVR exposures limits and that sun protection was not used consistently.

Results from a study of expeditioners with the Australian Antarctic Division showed that, even in the Antarctic, more than 80% of the expeditioners received UVR exposures in excess of the limits with 70% of the workers reporting mild erythema despite sun protection being provided. During the summer of 2008-09, a collaborative study with the Cancer Council Victoria Centre for Behavioural Research on Cancer was carried out on shade structures above toddler pools and the UVR occupational exposure of lifeguards. Results of both studies are being analysed and will be published in 2009-10.

## **Extremely Low Frequency Magnetic Fields and Health**

It was expected the Standard titled *Limits and Precautionary Measures for Reducing Exposure to Electric and Magnetic Fields – 0 Hz to 3 kHz* would be completed during this year.

The exposure standard for ELF electric and magnetic fields seeks to limit exposure to protect against harmful effects of the fields on the human body and incorporates a strong precautionary approach requiring reduction of exposures to people where justified by a cost-benefit analysis to address the uncertain effects. However, the public consultation process produced over sixty submissions expressing disparate views. The task of resolving these views proved to be substantial and the anticipated publication date was not met. A near-complete draft was circulated to the ELF Consultative Group in May 2009 and it is anticipated that the standard will be finalised during 2009-10.

An important feature of the draft Standard is the inclusion of a precautionary requirement to assess the potential for reducing exposures of the population to ELF magnetic fields. To facilitate implementation of this precautionary strategy, information about actual exposures, their source and possible reduction measures, is needed. ARPANSA has already largely completed the measurement and analysis phases of a survey of extremely low frequency (50 Hz) magnetic field levels in about 300 Melbourne homes. Final analysis of the spot measurements and 24-hour averages in living rooms and bedrooms is being undertaken along with an investigation into the important parameters relevant to higher than usual exposures.

## **Australian National Radiation Dose Register**

The Minister for Resources, Energy and Tourism, The Hon Martin Ferguson AM MP, announced on 22 September 2008 the funding for the development of an

Australian National Radiation Dose Register (ANRDR) for the collection, storage and auditing of radiological dose histories for uranium industry workers across Australia. ARPANSA is responsible for the design and development of the dose register and for the development of a safety guide on the assessment of radiation exposure to uranium industry workers.

ARPANSA held a stakeholder workshop in February 2009 to discuss the design of the Dose Register. The workshop was well attended by industry and government stakeholders who provided feedback on the design process. The design documentation and technical specifications for the Dose Register were completed in March 2009, and the construction of the Register began in May 2009.

A report detailing the draft structure and layout of the safety guide was completed following initial stakeholder consultation in May 2009. The first draft of the safety guide was completed on 30 June 2009. An information paper on the development of the ANRDR and safety guide was presented at the Uranium Public Information Evening held in Darwin on 11 June 2009 as part of the AusIMM International Uranium Conference and technical details were presented at an associated workshop.

## **Environmental Radioactivity**

ARPANSA and its predecessors have maintained an Australia-wide environmental monitoring program for nearly fifty years, including a network of stations monitoring fallout. Shortly after the creation of ARPANSA, approximately half these stations were replaced with systems that

support Australia's obligations under the Comprehensive Nuclear-Test-Ban Treaty (CTBT) which sample on a daily basis. These CTBT stations collect samples on a daily basis and with modern computer modelling it is now possible to accurately predict from this data the radiation fallout across Australia. As a result of the rationalisation of the network, the remaining stations in the old network were closed down during the year.

ARPANSA has the capacity to measure radioactive materials in environmental samples. Over the years a service has been offered to measure environmental samples on a fee for service basis. This commercial radioanalytical measurement service has grown significantly over the years and started to impact on the resources that ARPANSA could devote to assessing the environmental impacts of radioactive materials on Australian communities and ecosystems. In order to understand the significant environmental pathways in the Australian environment, it is important to generate Australian specific data. Consequently, I chose to reduce ARPANSA's provision of commercial radioanalytical services particularly in areas where other commercial services are available. This will enable more resources to be devoted to the understanding of Australian ecosystems to assist in the understanding of the impacts of uranium mining and radioactive waste disposal.

## **Security of Sources**

ARPANSA performed as the lead agency to coordinate the nationally uniform implementation of the Council of Australian Governments (COAG) Report on the Regulation and Control of Radiological Material (COAG Report). The COAG

Report recommends strengthening the security of dangerous radioactive sources through better legislative and administrative controls, development and application of a nationally uniform protective security standard, establishment of a national register of high activity radioactive sources and a security incident report system.

ARPANSA published the *Code of Practice for the Security of Radioactive Sources* in 2007 following agreement by all jurisdictions. The code of practice was developed as part of Australia's commitment to comply with the IAEA *Code of Conduct on the Security of Sources*. The code of practice specifies a national set of physical and procedural security requirements designed to decrease the likelihood of unauthorised access to, or acquisition of, any sealed radioactive source by terrorists or persons with malicious intent.

The Australian Radiation Protection and Nuclear Safety Regulations 1999 were revised in December 2008 to include this code as a licence condition under Regulation 48 and as a requirement for all controlled persons under Regulation 62A. It is mandatory for ARPANSA licence holders and controlled persons to comply with the code from 1 July 2009.

ARPANSA conducted nationwide protective security training for State and Territory radiation protection regulators and their licensees. The training covered the new regulatory requirements for the security of sources, including the requirements of the ARPANSA *Code of Practice for the Security of Radioactive Sources*, the fundamentals of protective security and techniques and guidance for developing practice specific security plans.

ARPANSA currently operates an interim national register of high activity radioactive sources and has commenced the development of an electronic real-time national register. ARPANSA also worked with State and Territory radiation regulatory bodies and police towards development of a uniform national background checking system to meet the requirements of the code.

## Other Highlights

### Regulation of Research Reactors

The Open Pool Australian Lightwater (OPAL) reactor operated by the Australian Nuclear Science and Technology Organisation (ANSTO) is now in the final stages of Stage C Commissioning and has been monitored by ARPANSA during 2008-09 through a program of planned announced and unannounced inspections. In addition, ARPANSA approved a large number of requests for modifications of reactor systems during this period. A priority for ARPANSA during the reporting period was to monitor the implementation of the OPAL Business Management System and the status of its maintenance program and closure of events identified in its event management system.

Two other research reactors at ANSTO the High-flux Australian Reactor (HIFAR) and the MOATA reactor have been shut down for some years. ARPANSA issued a facility licence authorising ANSTO to possess or control HIFAR on 15 September 2008. This will enable ANSTO to place HIFAR in a state of safe enclosure prior to obtaining an authorisation for HIFAR's eventual decommissioning. A facility licence authorising ANSTO to decommission



the MOATA reactor was issued shortly after the commencement of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the ARPANS Act). MOATA was shut down prior to the commencement of the ARPANS Act and all fuel has been removed from this reactor. During 2008-09, ARPANSA approved pre-dismantling activities to be undertaken. The next stage in decommissioning will be a request for approval to dismantle the bio shield of the reactor.

### **ARPANSA website**

An important role for ARPANSA is to provide advice and disseminate information to the public on radiation protection and nuclear safety. One of the most effective ways of achieving this is to place information on the ARPANSA website. During 2008-09, there were 986 682 visits to the ARPANSA website. The most popular web pages were radiation and health information sheets and educational pages dealing with the basics of radiation science. Visitors downloaded 153 019 documents, predominantly fact sheets about magnetic and electric fields of various frequencies and documents from the ARPANSA Radiation Protection Series (RPS).

### **Services**

ARPANSA holds the Australian measurement standards for exposure and absorbed dose for ionizing radiation and continued to provide traceable calibrations for protection level and therapy dosimeters during 2008-09. In addition, dosimetry audits of therapy treatment centres, designed to assure the correct implementation of the calibrations supplied to hospitals, were undertaken.

ARPANSA has continued to provide other services such as the personal radiation monitoring service, which provides a service for approximately 26 000 wearers in Australia, and a radiopharmaceutical quality assurance program for the Therapeutic Goods Administration. In the non-ionizing radiation area, over five million 'UV Swing-Tags' were provided to garment manufacturers, certifying that the fabrics used in the manufacture of the garment exceeded UV protection factor requirements.

### **Quality Management System**

The ARPANSA quality management system that was been developed for radiation measurement services has been extended to regulatory and policy services during 2008-09. The Regulatory and Policy Branch is implementing an upgraded quality management system to assist it meet the needs of stakeholders and improve management of the branch. The quality system is documented in a quality manual that defines policies, procedures and responsibilities. The quality system is consistent with the ARPANSA Corporate Quality System which in turn has been designed to meet the requirements of AS/NZS ISO 9001:2000.

The quality management system provides an assurance to our stakeholders that regulatory and policy processes are open and accountable and services are provided in an effective and efficient manner that is subject to continuous improvement. Stakeholder feedback was received at a Licence Holders Forum in December 2008.

This quality management system is currently being revised and improved. A quality committee is in place and is meeting each month to ensure suitable progress of this

review. Significant progress has been made in 2008-09 with the development and documentation of the Scope of Services and Management of Services documents and identification and development of policies and procedures that require updating.

## Council and Committees

The annual reports of the Radiation Health and Safety Advisory Council, the Radiation Health Committee and the Nuclear Safety Committee are included as Appendices 7 and 8 of this report.

### Radiation Health and Safety Advisory Council

The Radiation Health and Safety Advisory Council met three times during 2008-09. The triennium of the Council ended on 30 September 2008 and a new council was appointed by the Parliamentary Secretary for the 2009-11 triennium. At the last meeting of the previous Council in August 2008, the final report on the effectiveness and efficiency of the *National Directory for Radiation Protection* (NDRP) was discussed. The Council concluded that the NDRP provided a catalyst for change in promoting uniformity of radiation protection regulatory processes. Council noted that the requirements for regulatory impact statements have become more onerous since the publication of Edition 1 of the NDRP and that this has contributed to extending timelines in producing amendments to the NDRP.

The outgoing Council produced a report on intermediate level waste in September 2008 and as a result the new council decided to develop a scoping review on the types of intermediate level waste in Australia and the types of regulatory guidance required.

During the year the Council recommended seven safety guides and one code of practice to the CEO for adoption that had been developed by the Radiation Health Committee.

### Radiation Health Committee

The triennium of the Radiation Health Committee (RHC) ended on 31 December 2008. The Committee met three times during the year. The Committee drafted a strategy for the next triennium.

The revision of the Recommendations for Limiting Exposure to Ionizing Radiation was the top priority for the Committee following the publication by the International Commission on Radiological Protection (ICRP) in 2007 of its revised recommendations. Priority outcome areas included medical applications of ionizing radiation, industrial radiography and environmental protection guidelines for industries enhancing naturally occurring radioactive materials. During the year the Committee produced seven safety guides, including three on medical applications, and one code of practice. The three medical safety guides will be particularly important in optimising radiation exposures for medical procedures.

### Nuclear Safety Committee

December 2008 was also the end of the triennium for the Nuclear Safety Committee. In total, the Committee met twice during the year. In October 2008 the Committee considered safety management systems in other industries and in May 2009, held a workshop on the regulatory review of safety management systems.



## International Activities

ARPANSA continues to be an active participant in international fora to contribute to and learn from international best practice in radiation protection and nuclear safety.

During the year Professor Peter Johnston, Director of the Environmental and Radiation Health Branch was appointed by the Director General to be a member of the Commission on Safety Standards (CSS), which oversees the development of the IAEA safety standards, now regarded as a fundamental framework for radiation protection and nuclear safety throughout the world. ARPANSA staff continue to participate in the committees that advise the CSS on radiation, waste and transport safety.

In April 2009, Professor Peter Johnston led the Australian delegation to the third international review meeting carried out under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Australia presented its report on how the Commonwealth and States meet their requirements of the Convention referring to the arrangements for managing radioactive wastes in each jurisdiction. The meeting reviewed country reports from all the countries that participated in the meeting and was an important venue for sharing international experience in managing radioactive wastes.

An important international development in radiation protection was the publication by the International Commission on Radiological Protection of its new Recommendations for radiation protection

in 2007. The changes relate to an increased emphasis on the optimisation of radiation protection and a better structure for considering radiation protection in existing situations and in emergencies. Changes arising from the new ICRP Recommendations will be reflected in the IAEA's review of its Basic Safety Standards and in an Australian review of the publication RPS 1.

As the Australian representative to the UN Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), I attended the 56<sup>th</sup> session of the Committee. The meeting finalised a report to the General Assembly of the UN on global exposures to the public and workers from natural and manmade sources and medical exposures to patients in diagnostic procedures. Diagnostic medical exposures have doubled in the last fifteen years and are now 25% of radiation exposures from natural sources worldwide and 80% in countries with high levels of health care. The UNSCEAR report also included the assessment of exposures from the Chernobyl nuclear power plant accident and the assessment of the effects of radiation on non-human biota.

Dr Colin Roy continued to participate in the work of the World Health Organization (WHO) on electromagnetic fields and with the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

## Management of ARPANSA

The ARPANSA Executive Board comprising the CEO, branch directors and an external member continued as the major vehicle for collegiate decision-making in the administration of the Agency. Dr Sue Barrell

from the Bureau of Meteorology continued as the external member of the Board and I thank her valuable contribution.

The Board met 11 times in 2008-09. Two of those meetings were 'extended' to include the participation of all the section head level staff in the Agency to address overall strategic issues. During the previous year the Board commenced a review of ARPANSA's three year corporate plan focussing on strategic directions and priorities. New strategic directions for the four years 2008-12 was finalised in the first quarter of 2008-09. Senior managers met on a weekly basis to discuss and exchange information on immediate issues.

The Executive Board also functions as ARPANSA's Quality Committee and reviews reports from the Agency's Occupational Health and Safety Committee. It allocates a resources budget each year, monitors budget progress each month and undertakes a mid-year review. Every two months, the Board reviews a 'Performance and Accountability Report' of progress on the significant projects included in the *ARPANSA Strategic Directions 2008-2012*.

An important initiative that began in 2007-08 was the establishment of ARPANSA's Graduate Recruitment Program. Three graduates were recruited and commenced a program at ARPANSA in February 2008 to undertake a program of training and doing project work in a number of areas in ARPANSA. These graduates are now approaching the end of their second year and soon will be placed in permanent positions in Branches. A further three graduates were recruited in 2009, however it has been decided not to extend the program into 2010 pending a review of the success

of the scheme and a review of ARPANSA's ability to continue to finance the scheme within a the context of a tight budgetary framework.

## Accommodation

During 2008-09, the Executive Board approved a proposal to develop a plan for the renovation of the Yallambie premises. A Renovation Advisory Committee chaired by the Director of Legal and Corporate Branch, and comprising of staff representatives from the five Branches was set up to oversight the renovation. The building at Yallambie is over thirty years old and has not undergone any major renovations in that time. A decision was made to undertake the renovation for the following reasons:

- During that time, a number of Australian Building Codes, Regulations and Australian Standards have been updated. Whilst this has no impact on public safety, I have a duty of care to ensure that staff work in a facility that is safe, fit for purpose and environmentally compliant.
- The ARPANSA Yallambie Campus was purpose designed to meet the requirements of the Australian Radiation Laboratories prior to the formation of ARPANSA in 1999. Since its formation ARPANSA continues to be responsible for activities formerly undertaken by ARL and has additional functions which have evolved over time. Consequently, the building, in its current configuration, does not adequately support the activities undertaken.
- Over a number of years, staff have needed to reshape functional areas to suit changing requirements. This has meant that a significant number of additional

offices have been developed which now adversely affect the balance of the air-conditioning system, the flow of foot traffic through the building and the penetration of natural light to central areas. ARPANSA has also identified the need to replace a significant proportion of the buildings, plant equipment and services.

- The Agency is also committed to implementing the Government's Energy Efficiency in Government Operations (EEGO) Policy and has planned the renovation works to incorporate materials and systems to attain a 5 star rating in accordance with the Australian Building Greenhouse Rating.

Plans to refurbish the Yallambie premises have been developed and these will be considered by the Executive Board in 2009-10.

## Audit Committee

ARPANSA has an Audit Committee to assist the CEO to maintain and improve the effectiveness of the internal control framework, risk management processes and the quality of the financial management and reporting processes including compliance with relevant legislation in particular the *Financial Management and Accountability Act 1997*.

The Audit Committee comprises an independent chair, two senior managers from within ARPANSA and an external member. Representatives of the Australian National Audit Office attended Committee meetings as observers and the Agency's internal auditor, Oakton Services Pty Ltd, Chief Finance Officer, and Corporate Counsel attended meetings to report on

particular matters. Branch Directors were also invited to attend on occasions to discuss particular audit reports. The Audit Committee met three times in 2008-09 and reported to the CEO after each meeting. The Committee identified no material issue with the accounts for 2008-09 and recommends they be signed. A review by Internal Audit found that ARPANSA's internal controls were operating effectively.

The Committee also reviewed compliance with the FMA Act for the past twelve months through quarterly assurance questionnaires and random samples of transactions and proposed that, in light of continuing sound levels of compliance, the quarterly assurance questionnaire be conducted six monthly in future. The Committee concluded that there are sufficient measures in place to provide reasonable assurance that ARPANSA is meeting its responsibilities under the FMA Act, Regulations and Orders and recommended that the Certificate of Compliance should be signed.

## Finance

The year 2008-09 saw the completion of recruitment actions for programs initiated in previous years and consequently ARPANSA has, for the first time in several years, a full compliment of staff raising employee expenses to 58% of total expenses. This at a time when income has been restrained by reduced appropriation and reduced license fees. Increases in depreciation due to an IT procurement program and the capitalisation of the recently acquired medical linac as well as an increase in running expenses, have also put pressure on the budget. Overall ARPANSA incurred a small deficit

for the year amounting to \$0.199m, or approximately 0.8% of revenue. The loss can be attributed to employee provision adjustments at year end, and to a one-off accrual of expenses associated with the recruitment of a new CEO.

## **Directions under Section 16 of the Act**

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

## **Outlook for 2009-10**

The implementation of a 4% wage rise in April 2009 as the final rise under the current Certified Agreement will put more pressure on the 2009-10 budget. As a consequence, the Executive Board has decided that, in order to bring in a balanced budget, it would not proceed with a Graduate Recruitment Program next year.

Peter Burns PSM  
Acting CEO of ARPANSA

## ***Part 2: Agency Overview***



## Agency Overview

The Chief Executive Officer (CEO) of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a statutory office holder under the *Australian Radiation Protection and Nuclear Safety Act 1998* (ARPANS Act). The Act allows the CEO to engage staff to assist the CEO perform his statutory functions. Together, the CEO and staff constitute a statutory agency for the purposes of the *Public Service Act 1999* and a prescribed agency under the *Financial Management and Accountability Act 1997* within the Australian Government Health and Ageing portfolio.

The Parliamentary Secretary to the Minister for Health has Ministerial responsibility for ARPANSA.

The CEO has a statutory responsibility under the ARPANS Act to make regulatory decisions and provide advice and services consistent with the protection of the health and safety of people, and the protection of the environment, from the harmful effects of radiation – both ionizing and non-ionizing.

The Radiation Health and Safety Advisory Council (the Council), the Radiation Health Committee and the Nuclear Safety Committee play important roles working with the Agency.

The Council identifies emerging issues relating to radiation protection and nuclear safety, examines matters of major concern to the community in relation to radiation protection and nuclear safety, advises the CEO on the adoption of recommendations, policies, codes and standards in relation to radiation protection and nuclear safety and advises and reports to the CEO on other

matters relating to radiation protection and nuclear safety.

The Radiation Health Committee advises the CEO and the Council on matters relating to radiation protection, including formulating draft national policies, codes and standards for consideration by the Commonwealth, states and the territories.

The Nuclear Safety Committee advises the CEO and the Council on matters relating to nuclear safety and the safety of controlled facilities, including developing and assessing the effectiveness of standards, codes, practices and procedures.

The CEO of ARPANSA has statutory regulatory powers that he exercises to ensure the protection of the health and safety of people and the environment in relation to facilities and controlled material and apparatus that are in the possession or control of, operated or used by Australian Government departments, agencies, statutory authorities, bodies corporate, government business enterprises and Commonwealth contractors.

## Role and Functions

Mission – protecting people and the environment from the harmful effects of radiation.

Role – the Australian Radiation Protection and Nuclear Safety Agency is the national centre for excellence in radiation protection and nuclear safety.

Objective – concern about exposures to radiation has led to the development of a high standard of radiation protection and nuclear safety in Australia. ARPANSA

seeks to maintain and enhance this level of protection in the delivery of its programs.

This objective is achieved by:

- advising the government and the community about radiation protection and nuclear safety
- representing Australia in international forums that develop new principles and practices in radiation protection and nuclear safety
- undertaking research and providing services in the field of radiation protection
- promoting national uniformity of radiation protection and nuclear safety
- being an independent regulator of the use of radiation and nuclear technology.

## Organisational Structure

ARPANSA is located at Miranda in Sydney and at Yallambie in Melbourne and also has staff located in Canberra that are accommodated within the Department of Health and Ageing.

The Regulatory and Policy Branch is co-located at Miranda, Yallambie and Canberra. It provides advice to the CEO on the exercise of his regulatory powers, provides support to the CEO in relation to ministerial services and specific policy initiatives such as the implementation of improved physical security for radioactive sources in Australia, in particular through the development and implementation of the *Code of Practice for the Security of Radioactive Sources* (ARPANSA 2007). The Regulatory and Policy Branch supports the development of codes and standards and works with the Radiation Health and Safety Advisory

Council, the Radiation Health Committee and the Nuclear Safety Committee.

The Agency's three scientific branches are located at Yallambie.

The Environmental and Radiation Health Branch provides advice in relation to exposure from natural and artificial ionizing radiation in the environment and the workplace and its impact on human health and the environment. This includes the monitoring of airborne releases from clandestine use of nuclear weapons as part of Australia's commitment to the Comprehensive Nuclear Test Ban Treaty (CTBT), the assessment of radiological impact of uranium mining on workers and the environment and the support to Australian planning and response to radiological and nuclear emergencies, including incidents involving the malevolent use of radioactive material.

The Medical Radiation Branch provides advice and services and undertakes research in relation to medical ionizing radiation exposures, in particular the maintenance and dissemination of national radiation dose measurement standards and population dose surveys from diagnostic radiation procedures. The Branch is actively engaging with the medical professions to optimise the use of radiation in medicine and to ensure the best outcomes for patients.

The Non-ionizing Radiation Branch provides advice and public information on the impact of non-ionizing radiation on human health and the environment, in particular the impact of ultraviolet radiation exposure on the Australian population and the possible health effects from mobile

telephone technology and high voltage powerlines. To support these functions, the Branch maintains the appropriate expertise and undertakes relevant research and development and conducts surveillance measurement programs of non-ionizing radiation. The Branch also monitors relevant international scientific literature.

The Corporate Services Branch has recently been amalgamated under the Director Legal and Corporate Branch. The Branch operates out of both Sydney and Melbourne and contains the legal services, information management; corporate governance; finance; people management and strategy section, property and administration services section.

At 30 June 2009 ARPANSA employed a total of 146 staff in Miranda and Yallambie. An organisation chart is provided at Figure 1.

## Outcome and Output Structure

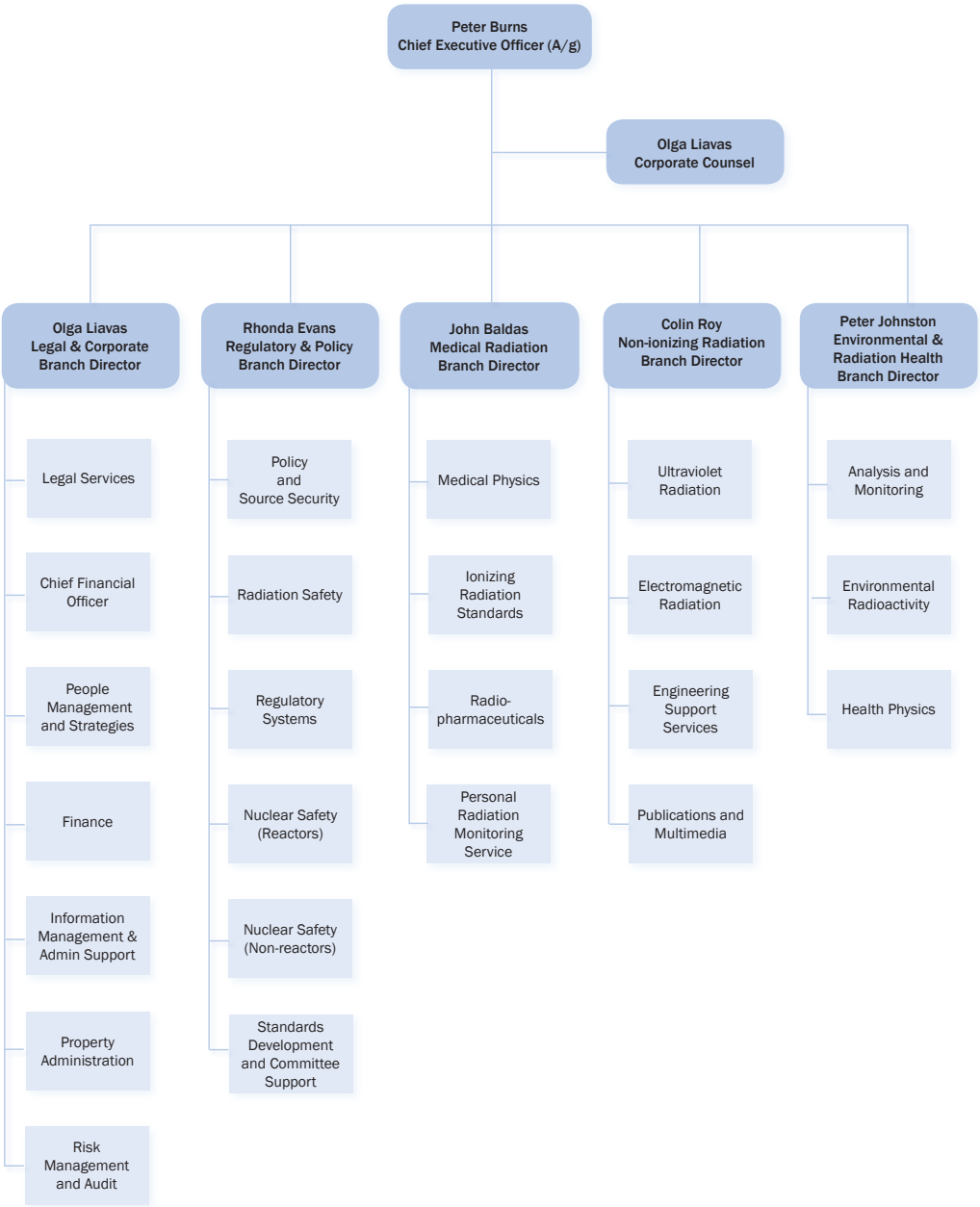
In 2008-09, ARPANSA's activity, resource and performance reporting fell under the outcome – the Australian people and the environment are protected from the harmful effects of radiation.

The core activities for the reporting year are described in terms of the following three output groups:

- Output Group 1 – National leadership in radiation protection and nuclear safety
- Output Group 2 – Knowledge, information and services relating to radiation protection and nuclear safety
- Output Group 3 – Regulation of Commonwealth entities using radiation sources and facilities or nuclear installations.



Figure 1: Organisation Chart





## ***Part 3: Report on Performance***



## Review of Performance

### Discussion and Analysis of Financial Performance

In terms of cash, ARPANSA's final usage of all resources is reflected in Table 1. The Government funds ARPANSA to

provide agreed outputs to the Australian Community. During 2008-09, the activities of the Agency were reported under three output groups. The total price for the year, of these output groups was \$24 857 million as detailed in Table 2.

ARPANSA reported an operating deficit of \$0.199 million for the year. The

**Table 1: ARPANSA Resource Statement – 2008-09**

	<b>Actual Available Appropriation for 2008-09 \$'000 (a)</b>	<b>Payments Made 2008-09 \$'000 (b)</b>	<b>Balance Remaining 2008-09 \$'000 (a-b)</b>
<b>Ordinary Annual Services<sup>1</sup></b>			
<b>Departmental appropriation</b>			
Prior year departmental appropriation	3 795	3 795	-
Departmental appropriation	15 616	11 500	4 116
<b>Total</b>	<b>19 411</b>	<b>15 295</b>	<b>4 116</b>
<b>Total ordinary annual services</b>	<b>19 411</b>	<b>15 295</b>	
<b>Other services<sup>2</sup></b>			
<b>Departmental non-operating</b>			
Prior year equity injections	3 200	2 700	500
<b>Total</b>	<b>3 200</b>	<b>2 700</b>	<b>500</b>
<b>Total other services</b>	<b>3 200</b>	<b>2 700</b>	
<b>Special Accounts</b>			
Opening balance	2 328		
Appropriation Receipts	17 995		
Non-Appropriation receipts to	10 568		
Special Accounts			
Payments made		28 242	
Closing Balance			2 649
<b>Total resourcing and Payments</b>	<b>53 502</b>	<b>46 237</b>	
Less departmental appropriations and equity injections drawn from the above and credited to special accounts	(22 611)	(17 995)	
<b>Total net resourcing and payments for ARPANSA</b>	<b>30 891</b>	<b>28 242</b>	

<sup>1</sup> Appropriation Bill (No.1) 2008-09

<sup>2</sup> Appropriation Bill (No.2) 2008-09

**Table 2: ARPANSA Resources for Outcome****Outcome:****The Australian People and the Environment are Protected from the Harmful Effects of Radiation**

	<b>Budget 2008-09 \$'000 (a)</b>	<b>Actual Expenses 2008-09 \$'000 (b)</b>	<b>Variation \$'000 (a-b)</b>
<b>Output Group 1:</b>			
Departmental Outputs			
National Leadership			
Special Accounts			
Australian Radiation Protection and Nuclear Safety Agency - S21 FMA Act 1997			
Appropriation receipts	7 689	4 198	3 491
Non-Appropriation receipts to Special Accounts	1 591	1 610	-19
<b>Subtotal for Output Group 1</b>	<b>9 280</b>	<b>5 808</b>	<b>3 472</b>
<b>Output Group 2:</b>			
Departmental Outputs			
Knowledge, Information and Services			
Special Accounts			
Australian Radiation Protection and Nuclear Safety Agency - S21 FMA Act 1997			
Appropriation receipts	8 464	9 422	-958
Non-Appropriation receipts to Special Accounts	4 159	4 129	30
<b>Subtotal for Output Group 2</b>	<b>12 623</b>	<b>13 551</b>	<b>-928</b>
<b>Output Group 3:</b>			
Departmental Outputs			
Regulation			
Special Accounts			
Australian Radiation Protection and Nuclear Safety Agency - S21 FMA Act 1997			
Appropriation receipts	1 993	1 996	-3
Non-Appropriation receipts to Special Accounts	4 563	3 502	1 061
<b>Subtotal for Output Group 3</b>	<b>6 556</b>	<b>5 498</b>	<b>1 058</b>
<b>Total for Outcome</b>	<b>28 459</b>	<b>24 857</b>	<b>3 602</b>
<b>Average staffing level (number)</b>		<b>138</b>	

Agency’s income totalled \$24.658 million. Government appropriation accounted for 64%, licence fees and charges for 14% and sales of goods and services for 22%. Expenses totalled \$24.857 million for the year. Employee expenses accounted for 58% of total expenditure, suppliers for 35% and depreciation and amortisation for 7%.

The operating deficit can largely be attributed to adjustments to non-cash expenses, specifically the recalculation of accrued employee entitlements.

There have been no developments since the end of the financial year that have affected or may significantly affect the Agency’s operations or financial results in future.

### Key Strategic Directions for 2008-09

The 2008-09 Budget provided appropriation to ARPANSA for its Outcome – ‘The Australian people and the environment are protected from the harmful effects of radiation’.

The key strategic directions for ARPANSA in 2008-09 as identified in the Portfolio Budget Statement are detailed in Table 3.

Table 3: 2008-09 Key strategic directions according to output groups		
Output Group		Strategic Direction
Output Group 1	National leadership in radiation protection and nuclear safety	Strengthen knowledge and contribution to international best practice in radiation protection and nuclear safety
Output Group 2	Knowledge, information and service relating to radiation protection and nuclear safety	Ensure health protection through providing operational capacity, information, service and advice about radiation protection and nuclear safety
Output Group 3	Regulation of Commonwealth entities using radiation sources and facilities or nuclear installations	Apply best practice regulation through national uniformity and regulation of Commonwealth entities using radiation sources and facilities, and nuclear installations.

## Output Group 1 – National Leadership in Radiation Protection and Nuclear Safety

### Participation in Development of International Guidance

As the Australian Representative to the United Nations Scientific Committee on the Effects of Atomic Radiation, the Acting CEO of ARPANSA participated in the 56<sup>th</sup> session of the Committee. The meeting finalised a report to the General Assembly of the UN on global exposures to the public and workers from natural and manmade sources and medical exposures to patients in diagnostic procedures. Diagnostic medical exposures have doubled in the last fifteen years and are now 25% of radiation exposures from natural sources worldwide and 80% in countries with high levels of health care. The report also included the assessment of exposures from the Chernobyl nuclear power plant accident and the assessment of the effects of radiation on non-human biota.

ARPANSA represented Australia on all four standards committees of the International Atomic Energy Agency (IAEA). These Committees are the Radiation Safety Standards Committee, the Waste Safety Standards Committee the Nuclear Safety Standards Committee and the Transport Safety Standards Committee. In addition, during the year, the CEO of ARPANSA was a member of the IAEA Commission on Safety Standards (CSS).

During 2008-09, the CSS approved several important new standards including requirements for safety assessment for facilities and activities and safety guides for

classification of radioactive waste and on borehole facilities for disposal of radioactive waste.

ARPANSA also participated in the 12<sup>th</sup> Congress of the International Radiation Protection Association which examined:

- the theory of current knowledge on the physics and biology of radiation exposure and its effects, particularly in relation to its methods, validity and scope
- the universal conceptual models used for keeping people safe from health effects due to radiation exposure
- the actual application and use of radiation protection plans and methodologies by practitioners and industries making use of radiation.

Several papers were presented at the conference by ARPANSA. Other international committees convened by the Organisation for Economic Co-operation and Development also provided important avenues for Australian input on radiation and nuclear safety.

#### *Conference Papers*

Burns P, Melbourne A and O'Brien R. *Management of NORM in Australia* – presentation and paper 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Koukoulidou V, McDonald P, Horyna J, Perez-Sanchez D, O'Brien R. *Computer simulations of discharges from a lignite power plant complex*. 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

McDonald P, O'Brien R, Horyna J and Perez-Sanchez D. *Testing and comparing computer model simulations of a hypothetical point source discharge*. 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

O'Brien R, Yu C, McDonald P, (Gleizon P), Zeevaert T (deceased), Olyslaegers G, Horyna J and Amado V. *Comparison of model simulations of radionuclide migration from a hypothetical area source*. 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Scott J. *Regulatory considerations on the licensing of a mobile backscatter X-ray device*. 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Scott J and Railey L. *Regulatory Considerations in the Licensing of a Mobile Backscatter X-ray Device used in Security Screening* – presentation and poster 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Wallace A. *A Real-time Monitoring Study of the Personal Dose Received by a Nuclear Medicine Technologist (NMT) Administering FDG in a High Patient Throughput PET Centre* – presentation and poster. 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Wallace A. *Paediatric Multi-Slice CT Optimisation Training: A Survey of Common Scanning Procedures and the Resultant Dose Reduction Associated with Paediatric MSCT Investigations in Australia* – poster. 12<sup>th</sup>

Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Wallace AB, U P, Hickson K, Bradley J, Welch J and K Pathmaraj K. *A Real-Time Monitoring Study of the Personal Dose Received By Nuclear Medicine Technologists Administering <sup>18</sup>F-FDG in a High Patient Throughput PET Centre*. Proceedings IRPA 12, 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

Wallace AB, Sibelle K, Budd R, Stanley M, Goergen S and eggie JCP. *Paediatric Multidetector CT Optimisation Training: A Survey of Common Scanning Procedures and the Resultant Dose Reduction Associated with Paediatric MDCT Investigations in Australia*. 12<sup>th</sup> Congress of the International Radiation Protection Association (IRPA), Buenos Aires, Argentina, 19-24 October 2008.

## Radiation Safety

ARPANSA chaired a joint working group of the IAEA Transport Safety Standards Committee (TRANSSC) and Waste Safety Standards Committee (WASSC). The objectives of the working group were to identify issues common to both transport and waste safety, to consider any potential conflicts and gaps in the current standards documents, and to explore possible solutions to address the issues identified. An issue of specific relevance to Australian interests was a strong recommendation from the working group to retain the ten times higher limit for exempting shipments of naturally occurring radioactive materials than those imposed for artificial radioactive materials. Australia has strongly advocated this position because of the issues associated with mining.



Revision of the Basic Safety Standards occupied most of the meetings of the Radiation Safety Standards Committee (RASSC) as well as joint meetings of RASSC and WASSC attended by ARPANSA. The revision of Basic Safety Standards is in response to the *2007 Recommendations of the International Commission on Radiological Protection* and represents changes to the radiation protection system. These documents set international best practice in radiation protection and will be important in the review of Australia's radiation safety standards.

ARPANSA participated in IAEA TRANSSEC meetings during 2008-09, where the updated status of the regulations and safety documents as they relate to safe transport of radioactive material were reviewed. The issues arising from workshops on denial of shipments, and coordination between the TRANSSEC, RASSC and WASSC were a focus during 2008-09.

ARPANSA participated in the Radioactive Waste Management Committee and Regulators' Forum convened by the OECD-Nuclear Energy Agency (NEA) where experience in radioactive waste management activities in NEA countries, including licensing of waste repositories is shared to foster best practice. ARPANSA also participated in meetings of the Committee on Radiation Protection and Public Health with regulators and radiation protection experts, to identify new and emerging issues, analyse their possible implications and recommend or take action to address these issues to further enhance radiation protection regulation and implementation.

ARPANSA participated in the second meeting of the World Health Organization

(WHO) Global Initiative – Radiation Safety in Health Care Settings in Geneva, Switzerland in December 2008. The aim of the WHO Global Initiative is to advocate the safe and optimised use of ionizing radiation in medicine and to work internationally to promote radiation safety culture in health care settings in order to protect patients, health workers and the general public.

ARPANSA is represented on a small task group established by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) to draft new guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). The draft guidelines were developed following a thorough review of the published scientific literature. During 2009-10 the draft will be placed on the ICNIRP website for open consultation.

ARPANSA participated in the 10<sup>th</sup> biennial South Pacific Environmental Radioactivity Association Conference held in Christchurch, New Zealand, from 24-27 November 2008. The purpose of the conference was to promote communication among scientists in the South Pacific region in the field of environmental radioactivity and to discuss and debate the origins and behaviour of natural and anthropogenic radionuclides in the environment; their radiological consequences and the practices required to minimise these; and their application to the understanding of natural processes. ARPANSA presented several papers and chaired the session on Radiation Protection of the Public and Environment and presented a keynote address on *Naturally Occurring Radioactive Materials in Industry, Other Minerals, Mining and Processing*.

### Conference Papers

Hardege L and McKelvie I. *Sequential Injection Chromatography in the Development of Automated Radiochemical Separations*.

10<sup>th</sup> Biennial South Pacific Environmental Radioactivity Association (SPERA), Christchurch, New Zealand, 24-27 November 2008.

Long S. *Radioactivity content of some Australian drinking waters*. 10<sup>th</sup> Biennial South Pacific Environmental Radioactivity Association (SPERA), Christchurch, New Zealand, 24-27 November 2008.

Manickam E, Sdraulig S and O'Brien R. *An Improved and Rapid Radiochemical Method for the Determination of Polonium-210 in Urine*. 10<sup>th</sup> Biennial South Pacific Environmental Radioactivity Association (SPERA), Christchurch, New Zealand, 24-27 November 2008.

McLeish J. *Study of Groundwater Discharge into River Systems using Radon-222 as a tracer*. 10<sup>th</sup> Biennial South Pacific Environmental Radioactivity Association (SPERA), Christchurch, New Zealand, 24-27 November 2008.

### Nuclear Safety

During 2008-09 ARPANSA's participation in the IAEA Nuclear Safety Standards Committee focused on working towards an internationally agreed set of nuclear safety standards for nuclear facilities and their operation.

ARPANSA represented Australia at a meeting held in October 2008 to discuss the application of the IAEA *Code of Conduct on*

*the Safety of Research Reactors*. The meeting was attended by over 30 Member States.

The meeting emphasised the importance of international peer review and the need for all countries with research reactors to harmonise their approach to safety. Key issues that emerged at the meeting included the need to have an independent and effective regulatory body, development of good safety management and sound safety culture in the operating organisation, importance of ageing management and life extension for research reactors and the challenges of decommissioning.

ARPANSA was invited by the IAEA to join a consultancy group drafting an IAEA publication on 'Specific Considerations and Milestones in the Development of a Research Reactor' to be used by Members States that are considering developing a research reactor as a first step to implement nuclear technology in the country. It is also intended for Member States that are planning to build a new research reactor, designed for a specific purpose, to use it as a reference document. It is anticipated that the document will be finalised in 2009.

ARPANSA participated in IAEA and Nuclear Energy Agency groups that considered issues such as:

- nuclear safety in the region
- the Multinational Design Evaluation Program for new nuclear power plants, regulatory inspections, operating experience, public communication, regulation of new reactors, as well as discussion of events of regulatory interest based on the national reports of each Member country

- the need to coordinate the supply of radiopharmaceuticals and also to harmonise the safety standards for both research reactors and radiopharmaceutical production facilities.

### Radiological Security

During 2008-09, ARPANSA chaired meetings of the consultants group assisting the IAEA development of the Nuclear Security Fundamentals document. The document will contain objectives, concepts and elements of an effective nuclear security regime and will provide the basis for security recommendations level documents in the Nuclear Security Series.

ARPANSA submitted a paper and presentation to the inaugural International Symposium on Nuclear Security held at the IAEA in Vienna from 31 March – 3 April 2009.

ARPANSA also participated in the consultants group to develop recommendations on the physical security of radioactive material and associated facilities and assisted in the development and delivery of training material on the security of radioactive material during transport and nuclear forensics. ARPANSA hosted an IAEA regional training course on transport security which drew participants from customs, law enforcement, industry and radiation regulatory bodies in South-east Asia.

#### *Conference Paper*

Kumar S. *Implementing nuclear security within a federal system of government – Australian experience* – paper and presentation. Inaugural International Symposium on Nuclear Security Vienna, 31 March to 3 April 2009.

### Engagement with Australian Government and National Stakeholder Bodies

#### National Directory for Radiation Protection (NDRP)

ARPANSA seeks to promote national uniformity in radiation protection frameworks with the States and Territories. With this aim, a review of the effectiveness and efficiency of the *National Directory for Radiation Protection* was undertaken by the Radiation Health and Safety Advisory Council. Council's report and that of the consultant who analysed the data, was provided to the CEO in August 2008. This was subsequently referred back to the Radiation Health Committee in November 2008, for consideration as part of the Committee's ongoing strategy. The Committee also agreed to provide a report to Ministers by June 2009 on progress in implementing the National Directory. A working group to prepare this report has been formed, and it has now been requested to present a draft report for discussion at the November 2009 meeting of the Committee. The report will take account of the consultant's findings and the Council's report to the CEO.

During the reporting year, amendments to the *National Directory for Radiation Protection* were finalised which covered the addition of further detail to the exclusion and exemption provisions, adoption of the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* (ARPANSA 2008), and provisions for the regulation of solaria.

Health Ministers were asked to approve the first three amendments to the National Directory, including adoption of the *Code*

*of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* (ARPANSA 2008), by 10 March 2009. Endorsements from all Ministers except Queensland were received by June 30. When all endorsements are received, a revised edition of the National Directory will be published on the ARPANSA web site.

A fourth amendment to the National Directory, on regulation of solarium, was prepared and was endorsed by Australian Health Ministers Advisory Council. Ministerial approval through Australian Health Ministers Conference will be sought before incorporating the amendment in the National Directory.

Further amendments to the National Directory, which will include requirements for use of lasers and intense pulsed lasers in beauty therapy, and the disposal of low levels of radioactive waste by the user, are in preparation and require regulatory impact assessment.

It was expected the *Radiation Protection Standard for Limits and Precautionary Measures for Reducing Exposure to Electric and Magnetic Fields – 0 Hz to 3 kHz* would be completed during this year. It is expected that the Standard will be published during the next financial year.

Implementation of the *Code of Practice for the Medical Applications of Ionizing Radiation*, which was published in May 2008, was expected during the year. However, several jurisdictions requested additional time and suggested a common implementation date of 1 July 2009. Victoria subsequently asked for a further six months to allow for further consultation prior to implementing the code.

Five safety guides were published during the year. These were on radiation protection in: diagnostic and interventional radiology; nuclear medicine; radiotherapy; management of naturally occurring radioactive waste; and predisposal management of radioactive waste.

Overall there has been significant progress on uniformity issues, but still much work and further challenges remain to be met.

### Security of Sources

ARPANSA performed as the lead agency to coordinate the nationally uniform implementation of the Council of Australian Governments (COAG) *Report on the Regulation and Control of Radiological Material* (COAG Report). The COAG Report recommends strengthening the security of dangerous radioactive sources through better legislative and administrative controls, development and application of nationally uniform protective security standards, establishment of a national register of high activity radioactive sources and a security incident report system.

ARPANSA conducted nationwide protective security training for radiation protection regulators and their licensees. The training covered the new regulatory requirements for the security of sources, including the requirements of the ARPANSA *Code of Practice for the Security of Radioactive Sources*, (ARPANSA 2007) the fundamentals of protective security and techniques and guidance for developing security plans.

ARPANSA currently operates an interim national register of high activity radioactive sources. Data is supplied by radiation regulators at Radiation Health Committee meetings. ARPANSA completed a tender

process and selected a consultant to set up an electronic real-time National Register of Radioactive Sources.

ARPANSA also worked with State and Territory radiation regulatory bodies and police to develop a uniform national background checking system to meet the security background checking requirements of the *Code of Practice for the Security of Radioactive Sources* (ARPANSA 2007). The aim is to establish a system by mid-2010.

#### Australian National Radiation Dose Register

The Minister for Resources, Energy and Tourism, The Hon Martin Ferguson AM MP, announced on 22 September 2008 the funding for the Australian National Radiation Dose Register (ANRDR) to be developed by ARPANSA. The Dose Register involves the collection, storage and auditing of radiological dose histories for uranium industry workers across Australia. ARPANSA is designing, developing and will operate the database.

A capability questionnaire targeting key stakeholders (uranium mines, state and territory regulators) was circulated in December 2008 to assist in the design phase. Responses to the Capability Questionnaire, that allowed industry and regulators to comment on the ANRDR design process, were received from all key stakeholders in January 2009. ARPANSA conducted visits to the uranium mining operations in South Australia and the Northern Territory to gain a better understanding of industry practice in dose monitoring, dose assessment and record keeping.

ARPANSA held a stakeholder workshop in February 2009 to discuss the design of the

ANRDR. The workshop was well attended by industry and government stakeholders who provided feedback to the design process. The design documentation and technical specifications for the ANRDR were completed in March 2009, and the construction of the ANRDR began in May 2009.

The design and development of the ANRDR will rely on a uniform approach to dose estimate practices. A safety guide is being developed in parallel to the ANRDR and will provide recommendations on the methods for monitoring, assessing and recording occupational radiation doses. A report detailing the draft structure and layout of the safety guide was completed following initial stakeholder consultation in May 2009. The first draft of the safety guide was completed on 30 June 2009 and is on track to be submitted to the Radiation Health Committee at its November 2009 meeting.

An information paper on the development of the ANRDR and safety guide was presented at the Uranium Public Information Evening held in Darwin on 11 June 2009 as part of the AusIMM International Uranium Conference. In addition, technical papers on the ANRDR and safety guide were presented to industry professionals at the Radiation in Mining and Exploration Workshop held as part of the Conference.

#### *Conference Papers*

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.



### *Workshop Papers*

Cabrera P. *Privacy Information Collection and Disclosure*, Australian National Radiation Dose Register Workshop, Adelaide, 25 February 2009.

Davidson L. *The ANRDR Database: What is in it and how it is organised*, Australian National Radiation Dose Register Workshop, Adelaide, 25 February 2009.

Doering C. *The Australian National Radiation Dose Register*, AusIMM Radiation in Mining and Exploration Workshop, Darwin, 12 June 2009.

Doering C and Tinker RA. *Project Overview and Business Requirements for the Australian National Radiation Dose Register*, Australian National Radiation Dose Register Workshop, Adelaide, 25 February 2009.

Mason C, Doering EM and Tinker RA. *Development of a Safety Guide on dose assessment*, Australian National Radiation Dose Register Workshop, Adelaide, 25 February 2009.

Mason GC, Tinker R, Doering C, *Development of a Safety Guide on dose assessment*, AusIMM Radiation in Mining and Exploration Workshop, Darwin, 12 June 2009.

Osmanovic A. *The ANRDR System: From an Employers Perspective*, Australian National Radiation Dose Register Workshop, Adelaide, 25 February 2009.

Tinker R. *Strengthening radiation protection in the Australian uranium mining and milling industry*, AusIMM Uranium Public Information Evening, Darwin, 11 June 2009.

### International Monitoring Arrangements Under the Comprehensive Nuclear-Test-Ban Treaty

Australia, as a signatory to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), is committed to be part of a global monitoring network to detect the detonation of nuclear weapons. ARPANSA has the responsibility for establishing, operating and maintaining Australia's radionuclide air-sampling monitoring stations, which are integrated into the global monitoring system for enforcing and verifying compliance to the Treaty. ARPANSA continued to participate in CTBT Organisation (CTBTO) Working Group B meetings dealing with verification issues relating to the CTBT. During the reporting period, the five stations operated and maintained by ARPANSA met the 95% data availability required under the contract with the CTBTO.

In November 2008, a noble gas monitoring system was co-located with the radionuclide air monitoring station in Melbourne. ARPANSA undertook responsibility for this facility as of December 2008. In December 2008, ARPANSA entered into a contract with CTBTO for the installation of a radionuclide air sampling station on Macquarie Island, with the Australian Antarctic Division to provide infrastructure support.

In addition to operating the stations, ARPANSA also operated the CTBT Australian Radionuclide Laboratory, which has the role of testing samples obtained by other monitoring stations. The CTBT Australian Radionuclide Laboratory was available for receipt of samples, except for the period 27 January 2009 through 8 April 2009, and all measurements were performed and reported within the required times.

ARPANSA continued to liaise with CTBTO and relevant Commonwealth government agencies for the establishment of a further radionuclide monitoring station on the Antarctic mainland.

ARPANSA also maintained a CTBT National Data Centre that provided 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.

### Strengthening of Regional Capacities for Emergency Response

ARPANSA has established radiation emergency response teams to support Australian arrangements for nuclear and radiological emergencies. ARPANSA is working to further develop methods and procedures for the ARPANSA radiation emergency analysis and assessment capability. In July 2008, ARPANSA participated in the IAEA ConvEx 3 nuclear emergency exercise, through the provision of analysis and assessment products to support the decision making on protective actions.

During 2008-09, ARPANSA response teams engaged in national and international operations, exercises and training activities to extend Australia's radiation emergency response capability. ARPANSA officers successfully completed specialised radiation emergency training. ARPANSA undertook in-house training for Radiation Emergency Response & Analysis teams. This training resulted in additional trained ARPANSA officers available for support to an emergency or incident involving radiological or nuclear material, and refresher training for previously qualified officers. ARPANSA participated

in specialist ionizing radiation detection training, call-out exercises and readiness training and operational training activities on search, identification and recovery.

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

As a World Health Organization (WHO) Collaborating Centre for Radiation Protection, ARPANSA attended the 12<sup>th</sup> WHO Radiation Emergency Medical Preparedness & Assistance Network meeting held in Buenos Aires, Argentina in October 2008. The program dealt with the medical response to radiological accidents. An outcome from the meeting was the establishment of an 'International Internal Dosimetry Network'.

The software system, Accident Reporting and Guidance Operational System (ARGOS) is a decision support system for chemical, biological, radiological and nuclear (CBRN) emergencies. ARPANSA completed a national project to evaluate the suitability of ARGOS for Australian CBRN emergency planning. A Workshop on the Evaluation of ARGOS was hosted by ARPANSA in Melbourne in August 2008. The results of the evaluation and

Workshop were published as an ARPANSA Technical Report. The Report recommended that ARPANSA should continue the ongoing implementation of ARGOS as a tool to support Australian arrangements for nuclear and radiological emergency response. ARPANSA gave a presentation on ARGOS at a CBRN Science & Technology Workshop held in March 2009 at the Defence Science & Technology Organisation in Melbourne.

In its role as the Australian National Competent Authority (NCA) for Radiation Emergencies, ARPANSA attended the NCA Coordination Group meeting held in Budapest, Hungary in March 2009 to prepare the program for the IAEA National Competent Authority meeting in July 2009.

The Competent Authority Workshop planned for 2008-09 was postponed to await completion of supporting material from the IAEA action plan for strengthening radiation emergency preparedness. The workshop will be replaced with a program delivered through the ARPANSA SharePoint web portal in collaboration with the Asian Nuclear Safety Network. Activation of the web-portal is to be completed in 2009-10.

ARPANSA participated in a meeting of the Asian Nuclear Safety Network emergency preparedness and response topical group in Bangkok, Thailand from 22-26 September. ARPANSA provided advice on Regional Competent Authority activities that seek to ensure consistency across the radiation emergency preparedness activities in the

region. ARPANSA presented the Australian National Competent Authority Status Report.

#### *Technical Publications*

Grzechnik G, Tinker RA, Solomon S. *Evaluation of ARGOS for use in Australia*. ARPANSA Technical Report 150 (2008).

#### *Conference Papers*

Brown JMC, Tinker RA and Solomon S. *Development of an energy discriminate CR-39 nuclear track etch dosimeter for radon-220 measurements*. 10<sup>th</sup> Biennial South Pacific Environmental Radioactivity Association (SPERA), Christchurch, New Zealand, 24-27 of November 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.

Grzechnik G, Tinker RA, 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.

Wright T, Tinker, RA and Solomon S. *Improvements to ARPANSA's radon measurement facilities and a comparison between radon measurement instrumentation*. 10<sup>th</sup> Biennial South Pacific Environmental Radioactivity Association (SPERA), Christchurch, New Zealand, 24-27 November (2008).



**Table 4: Performance against PBS targets – Output Group 1**

Indicator	Reference Point or Target
Security of high activity radioactive sources measured by ARPANSA's response to reports of unsafe radioactive sources	All reports of unsafe sources responded to during 2008-09
<b>Indicator met:</b> ARPANSA provided technical advisory support and advice to government for radioactive sources lost to regulatory control during the financial year.	
The use of radiation in the different applications in Australia is conducted in accordance with the implementation of the international best practice national directory for radiation protection and standards, codes of practice and safety guides	Agreement to publication and amendments of the <i>National Directory for Radiation Protection</i>
	Response by June 2009 to the review of the effectiveness of implementation by the jurisdictions of the <i>National Directory for Radiation Protection</i>
<b>Indicator substantially met:</b> Three amendments to the National Directory were submitted to AHMC for approval. A working group was established to prepare a progress report to Ministers on the implementation of the National Directory.	
Engage with national and international agencies involved in radiation emergency preparedness through the ARPANSA SharePoint web portal	ARPANSA SharePoint web portal for Regional Competent Authorities operating by July 2008
	Conduct regional Competent Authority Workshop by December 2008
<b>Indicator partially met:</b> The regional web-portal has been activated and rolled-out to regional users. The competent Authority Workshop was not held.	
Strengthened national arrangements for medical response to radiation emergency	Conduct a national biodosimetry workshop with the Department of Health and Ageing in September 2008
	Participate in the World Health Organization radiation emergency medical preparedness assistance network meeting in October 2008
	Trained teams are operational with training and exercises by December 2008
	Complete the Accident Reporting and Guidance Operational System Chemical Biological Radiological and Nuclear decision support system evaluation report by December 2008
	Establish ARPANSA radiation emergency and analysis team by December 2008
<b>Indicator substantially met:</b> A workshop on Australian capability for biodosimetry assessment was held by ARPANSA. ARPANSA participated in the WHO network meeting. ARPANSA emergency response capabilities were maintained and developed. The evaluation report on ARGOS was published. Emergency and analysis teams are being established.	

## Output Group 2 – Knowledge, Information and Services Relating to Radiation Protection and Nuclear Safety

### Study of Science Relevant to Knowledge of Health Effects of Radiation

#### Ultraviolet Radiation (UVR) Measurements and Exposure Assessments

ARPANSA operates a spectral measurement system to ensure traceability to the National Measurement Institute, to permit calibration of the various detectors used to monitor UVR around Australia and, in the long term, to assist in international research in skin cancer.

During 2009, the new spectral measurement system acquired by ARPANSA in 2008 was installed and, from December, began daily operation in the rooftop laboratory in Melbourne. This new system provided continuously calibrated UVR measurements to allow regular calibrations of the detectors used in the solar UVR measurement network. Measurements of solar UVR in Australia and Antarctica have continued and data reliability was maintained at approximately 95% reliability.

The establishment of a Memorandum of Understanding between ARPANSA and the Bureau of Meteorology (BOM) for the BOM to continue to host ARPANSA UVR dataloggers was finalised in late 2008 to facilitate the installation of additional ARPANSA UVR dataloggers at various Bureau of Meteorology sites. The Memorandum includes the re-location of the Adelaide unit and the installation of UVR dataloggers in Canberra and Alice Springs. The dataloggers record solar UVR radiation levels at each site.

The provision of ARPANSA UVR measurement data has been further expanded and real time data was provided on the ARPANSA website ([www.arpansa.gov.au/uvindex/index.cfm](http://www.arpansa.gov.au/uvindex/index.cfm)) for Melbourne, Sydney, Darwin, Adelaide, Brisbane, Townsville, Newcastle, Kingston (outside Hobart) and Perth. ARPANSA provided historical measured UVR data for the Australian mainland measurement sites to the Cancer Council Victoria, the Department of Primary Industries and Fisheries and the University of WA to assist with correlation studies and for general research. In May 2008, ARPANSA hosted a UVR Alert meeting in preparation for spring and increasing solar UVR levels.

A collaborative study with the Cancer Council Victoria to measure the effectiveness of shade structures over toddler pools around Melbourne as well as the UVR exposures of lifeguards was undertaken in January 2009 and completed in March 2009. The study examined two groups, young children, as UVR exposures in early life are very important, as well as outdoor workers (lifeguards) who receive very high UVR exposures. A number of scientific publications summarising the results will be prepared from the study.

A collaborative study with Emory University in the United States resulted in three publications, one on the UVR occupational exposures of lifeguards published in the *American Journal of Industrial Medicine*, the second on the *Validity of Self-Reported Sunscreen Use by Parents, Children and Lifeguards*, and published in the *American Journal of Preventive Medicine* and the third on *Covering-Up and Sun Protection Habits* published in the *Journal of the American Academy of Dermatology*. Other

publications include: a co-authored Chapter entitled *Photoprotection by Fabrics* in the book *A Clinical Guide to Sunscreens and Photoprotection*, published in December 2008; a collaborative paper with the Bureau of Meteorology and the CSIRO entitled *The 2007 Antarctic Ozone Hole* published in the *Australian Meteorology Magazine*; and a study on the UVR exposures of expeditioners to the Australian Antarctic stations, done in collaboration with the Australian Antarctic Division Polar Medicine Unit which was finalised and is in press.

In relation to cosmetic use of solarium, ARPANSA participated in the meetings of the Standards Australia Committee on Solarium for Cosmetic Purposes to revise and update the existing Standard. The revised Standard included the introduction of lower limits on UVR emissions, stricter age limits and restriction of the allowed skin types of solarium users. Also during 2008-09, ARPANSA made measurements of solarium emissions from sun beds at numerous locations in Melbourne and Sydney to inform the deliberations of regulators developing requirements for the *National Directory for Radiation Protection*. A working group led by ARPANSA began development of a web-based training course for solarium operators to be made available in 2009. The measurements were also used for a scientific paper to be submitted to an international journal.

ARPANSA participated in meetings of Standards Australia on Sunscreens during 2008-09. In response to issues regarding sunscreen testing raised by the New Zealand Cancer Society, ARPANSA and the Therapeutic Goods Administration, it was decided that sunscreens should be tested and rated more conservatively.

## Publications

Gies P, Glanz K, O'Riordan D, Elliot T, Nehl E. *Measured Occupational Solar UVR Exposures of Lifeguards in Pool Settings*. Am J Indust 52:645-653, 2009.

Gies P, Watzl R, Javorniczky J, Roy C, Henderson S, Ayton J and Kingston M. *Measurement of the UVR Exposures of Expeditioners on Antarctic Resupply Voyages*. Photochem Photobiol. (in Press) June 2009.

Glanz K, McCarty F, Nehl E, O'Riordan DL, Gies P, Bundy L, Locke A and Hall DM. *Validity of Self-Reported Sunscreen Use by Parents, Children and Lifeguards*. Am. J. Prev. Med. 36:63-69, 2009.

Gordon L, Hirst NG, Gies PHF and Green AC. *What impact would effective solarium regulations have in Australia?* Med J Aust 189 (No.7):375-377, 2008.

Hatch KL, Block L and Gies P. *Photoprotection by Fabric*. In 'Clinical Guide to Sunscreens and Photoprotection' Eds. Henry W. Lim and Zoe D. Draelos, Dec 2008, pp 221-240.

Hirst N, Gordon L, Gies P and Green AC. (2009) *Estimation of avoidable skin cancers and cost-savings to government associated with regulation of the solarium industry in Australia*. Health Policy 89:303-311.

O'Riordan DL, Nehl E, Gies P, Bundy L, Burgess K, Davis E and Glanz K. (2008) *Validity of Covering-Up Sun Protection Habits: Association of Observations and Self-Report*. J. Am. Acad. Dermatol. 60:739-744, 2008.

Tully MB, Klekociuk AR, Deschamps LL, Henderson SI, Krummel PB, Fraser PJ, Shankin JD, Downey AH, Gies HP and

Javorniczky J. *The 2007 Antarctic Ozone Hole*. Australian Meteorological Magazine. 57:279-298, 2008.

#### *Conference Papers*

Gies P. *Ultraviolet Radiation Protection*, Keynote Presentation, 2008 Australian Radiation Protection Society (ARPS) Annual Conference, Canberra, Sept 21-24.

#### Electromagnetic Radiation

During 2008-09, public concern continued regarding the deployment of mobile telephone base stations within the community and the possible health effects of radiofrequency (RF) electromagnetic energy (EME) emissions from the base stations. Although health authorities around the world, including the World Health Organization, remain of the view that any harmful effects are unproven and unlikely, the public anxiety, itself, is an important issue. ARPANSA received requests for information from State and Australian Government departments and agencies and from the public and media regarding electromagnetic radiation and health. Occupational exposure to extremely low frequency and radiofrequency electromagnetic fields remains of increasing interest but the majority of enquires were in regard to possible health effects of magnetic fields from electricity distribution, particularly high-voltage transmission lines. Calls concerning mobile telephones and mobile telephone base stations and other wireless devices and household appliances were in the minority but still indicated a high level of concern among some members of the public.

As part of the Australian Communication and Media Authority's mandated consultation

process for the deployment of infrastructure, ARPANSA has specified a methodology and reporting format for an environmental EME report that provides robust predictions of the maximum exposure levels under reasonable assumptions. To help improve confidence in the EME reports and address public concern, ARPANSA gathered information on actual exposure levels and provided this to the public together with facts about the underlying science.

During 2008-09, ARPANSA developed plans and a protocol for an ongoing program of measurements of RF EME levels around a small selection of base stations throughout Australia. Measurements were carried out in the vicinity of mobile telephone base stations by National Association of Testing Authorities accredited RF assessors at precise locations specified by ARPANSA scientific officers following inspections and preliminary measurements. In collaboration with industry, measurements were made at 12 base stations: three in New South Wales, three in Victoria, one in Queensland, two in Western Australia, two in South Australia and one in Tasmania. Preliminary measurements at a base station in the Australian Capital Territory and planning for measurements of two additional sites in Queensland were completed. Full details of completed measurements are placed on the ARPANSA website at [www.arpansa.gov.au/RadiationProtection/BaseStationSurvey/index.cfm](http://www.arpansa.gov.au/RadiationProtection/BaseStationSurvey/index.cfm).

ARPANSA convened meetings of the EME Reference Group for representatives from community groups, industry and relevant non-government and government organisations, including ARPANSA and the Australian Centre for Radiofrequency Bioeffects Research (ACRBR) to discuss health issues and concerns arising from

wireless technologies, including mobile telephony, in Australia. During 2008-09, two meetings were held by ARPANSA at its office in Miranda, NSW, on 19 November 2008 and 5 May 2009. At the November 2008 meeting, discussions were held about new scientific publications of interest, recent media attention to possible health risks, and the Australian compliance regime for mobile telephone safety. The May 2009 meeting continued discussion on research into possible health effects and approved further sites to be included in the survey of base station emissions. Various topics concerning health effects of electromagnetic radiation of interest to the community were raised and the views of the government agencies were heard. The recruitment of new member representatives of the community was also discussed. As with past meetings, useful feedback was received from participants and this information was used to guide the preparation of public information on the issues and to help plan measurement programs.

ARPANSA attended and gave a presentation and interview at the public symposium Science and Wireless 2008, organised by the ACRBR on 12 November 2008. The purpose of the symposium was to help raise public awareness of mobile telephone research and answer questions about the health effects of mobile telephones and Wi-Fi in schools, home and the workplace. Presentations and interviews from Science and Wireless 2008 were professionally videorecorded and are available from the ACRBR website ([www.acrbr.org.au](http://www.acrbr.org.au)).

### Extremely Low-Frequency Standard

During 2008-09, it was expected that the *Radiation Protection Standard for Limits and Precautionary Measures for Reducing*

*Exposure to Electric and Magnetic Fields – 0 Hz to 3 kHz* (the ELF Standard) would be completed, however the working group found the task of reviewing 64 public submissions to be substantial. A near complete draft was circulated to the ELF Consultative Group for comment on 22 May 2009. Their feedback was reviewed and a revised draft of the standard will be forwarded to the July 2009 Radiation Health Committee meeting. Revised industry costings for the final regulatory impact statement were also sought, and these will be reviewed as part of the regulatory impact statement process. A technical editor will also review the draft standard in July 2009, to simplify the language where possible. It is expected that the ELF Standard will be published during 2009-10.

The ELF Standard recognises the considerable scientific uncertainty regarding possible links between long-term exposure to ELF magnetic fields and disease, particularly childhood leukaemia. An important feature of the draft Standard is the inclusion of a precautionary requirement to assess the potential for reducing exposures of the population to ELF magnetic fields, caused predominantly by electrical infrastructure and industrial equipment and domestic appliances. To facilitate implementation of this precautionary strategy, information is needed about actual exposures, their source and possible reduction measures. ARPANSA has already largely completed the measurement and analysis phases of a survey of extremely low frequency (50 Hz) magnetic field levels in about 300 Melbourne homes. Final analysis of the spot measurements and 24-hour averages in living rooms and bedrooms is being undertaken along with an investigation into the important parameters relevant to higher than usual exposures.

As part of implementation of the ELF Standard, ARPANSA is undertaking studies of significant contributors to public exposure including electrical power infrastructure such as transmission lines, sub-stations and publicly accessible high-current cables running underground and to and from overhead cabling. The magnetic fields vary in the spatial distribution and can approach or even exceed proposed public exposure limits (levels) in close proximity. ARPANSA has initiated a program of measurements to allow better understanding of these exposure sources and the potential for reducing public exposures through economically sensible means.

#### *Conference Papers*

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

Martin LJ and Wood A. *An Australian Exposure Standard for ELF Electric and Magnetic Fields*. Bioelectromagnetics Society Annual Meeting, Davos, Switzerland 14-19 June 2009.

Martin LJ & Henderson SI. *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.

#### **Health Physics**

ARPANSA maintains scientific expertise, modelling and analysis tools and measurement facilities to provide advice

on the protection of members of the public, workers and the environment.

ARPANSA participated in a radon potential mapping workshop in Oslo, Norway in August 2008 to develop a better understanding of radon measurements, transport mechanisms and mapping techniques to benefit current and future radiation health programs. ARPANSA also visited the Federal Office for Radiation Protection BfS in Germany and the Physikalisch-Technische Bundesanstalt to further develop knowledge and compare calibration techniques.

During 2008-09, due to concerns regarding the increased incidence of breast cancer amongst female employees a radiological survey was conducted of the former Australian Broadcasting Corporation (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 three months from July to September. The results of the survey were provided to the ABC.

In September 2008, a radiological assessment and inspection of the CSIRO Radiation Waste Store at Woomera, South Australia was conducted. The low radon-222 levels measured during this visit indicate that ventilation within the store is adequate to maintain levels below the recommended action levels in the workplace. ARPANSA conducted a technical audit of the radioactive waste disposal activities at the Mt Walton East Intractable Waste Disposal Facility and presented a final report to the Western Australian Department of Housing and Works. The audit was performed in accordance with and against



the requirements of the *Code of Practice for the Near-Surface Disposal of Radioactive Waste in Australia* (NHMRC 1992).

During November and December 2008, several detections of xenon-133 were made at the Comprehensive Nuclear-Test-Ban Treaty air sampling station sited at ARPANSA, Yallambie. In collaboration with Australian Nuclear Science and Technology Organisation (ANSTO) and the Comprehensive Nuclear-Test-Ban Treaty Organisation, atmospheric dispersion modelling tools were applied in order to determine the likely source of the xenon-133. Results of backtracking analysis by ARPANSA were consistent with the releases having been initiated at ANSTO, Lucas Heights. These releases were determined to be within the authorised limits of the regulator.

### Environmental Radioactivity

The 2007 Recommendations of the International Commission on Radiological Protection make the radiological protection of the environment explicitly international best practice. In Australia, there is currently no established criteria or nationally uniform approach to assess the effects of the releases of radionuclides on the environment (non-human biota and ecosystems).

There is a need to provide an integrated (and nationally uniform) approach to scientific, managerial and societal issues concerned with the environmental effects of releases of radionuclides with emphasis on non-human biota and ecosystems. This will ensure that decisions on environmental issues give appropriate weight to the environmental exposure, effects and risks from ionizing radiation, with emphasis on ensuring the structure and function of ecosystems.

ARPANSA began a review of existing approaches and data used to assess the effects of radionuclides on the environment in order to determine their relevance to Australian conditions for tropical and sub-tropical areas as well as for arid and semi-arid desert areas. The review will be completed during 2009-10. The initiative will establish reference data for transfer factors and organisms specific to the range of Australian conditions and ecosystems.

ARPANSA progressed its work on the development of methods of analysis focussing on the analysis of naturally occurring radionuclides and rapid methods of analysis of selected radionuclides in the event of an emergency. Further work was undertaken on the scientific investigation of methods developed for the analysis of polonium-210 in urine for background or occupational exposure. A method for determining low levels of polonium in fish and tinned seafood also progressed.

ARPANSA provided commercial services for radionuclide measurements to a limited set of clients. From January 2009 provision of commercial radioanalytical services were reduced to enable expansion of ARPANSA's radioanalytical research and development capabilities. In addition, the CEO initiated rationalisation of the ARPANSA fallout monitoring program as it mostly replicated the monitoring undertaken under by the Comprehensive Nuclear-Test-Ban Treaty network of Australian radionuclide stations. Stations in Adelaide, Brisbane, Melbourne and Hobart were marked for closure and a fifth station was marked for re-location. Relevant government agencies were advised of the decision.

ARPANSA maintained its National Association of Testing Authorities accreditation for radioanalytical services and completed the services required within the estimated reporting time in more than 98% of jobs (minimum requirement >95% completed within estimated reporting times). Radioanalytical services successfully participated in proficiency testing programs throughout the year with all results within acceptance limits.

#### *Publications*

Barnes EM, Long SA and Tinker RA. *Difficulties in obtaining an HPGe detector for low-level measurements*. Applied Radiation and Isotopes Volume 67, Issue 5, (2009).

#### *Technical Publications*

Hardege L. *Environmental Radioactivity Monitoring in Australia 2005 and 2006*. ARPANSA Technical Report 149 (2008).

Long SA, Sdraulig S, Hardege L and McLeish J. *The Radioactive Content of Some Australian Drinking Waters*. ARPANSA Technical Report 148 (2008).

#### *Conference Papers*

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

O'Brien RS, Waggitt PW, McDonald P, Horyna J, Koukoulidou V, Perez Sanchez D, Setlow LW, 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 (ARPS), Annual Conference, Canberra, 21-24 September 2008.

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

### **Scientific Programs to Support the Measurements and Assessment of Radiation (Ionizing and Non-ionizing)**

The *Radiation in Health Care – Safer and Better Use* program emphasises the importance of the use of ionizing radiation as a core element in medical diagnosis and in the treatment of cancer and other diseases.

#### **Surveys of Patient Doses**

The exposure to ionizing radiation of the Australian public from diagnostic imaging investigations is increasing. Whilst the risk to the individual remains low, the increase in overall number of investigations has made this population exposure an important public health issue. ARPANSA is carrying out patient dosimetry surveys to quantify this increase in population exposure and consequent increase in population risk. In particular, ARPANSA is undertaking a survey of doses received by patients undergoing computed tomography scans.

ARPANSA has worked to improve the safe and effective use of ionizing radiation in medical diagnosis and therapy by actively engaging with the medical professions, providing training and access to research facilities for persons working in the medical



radiation field and by providing radiation dose information, and information on techniques to reduce radiation doses to patients and occupationally exposed persons.

An analysis of Medicare Benefits Schedule for Multidetector Computed Tomography (MDCT) was completed during 2008-09 indicating the strong growth in the provision of MDCT services across the country. Figure 2 shows a greater than 3-fold increase for the total number of procedures from 1994 to 2008. It was, however, encouraging to note the moderate growth in paediatric MDCT services as compared with older age cohorts.

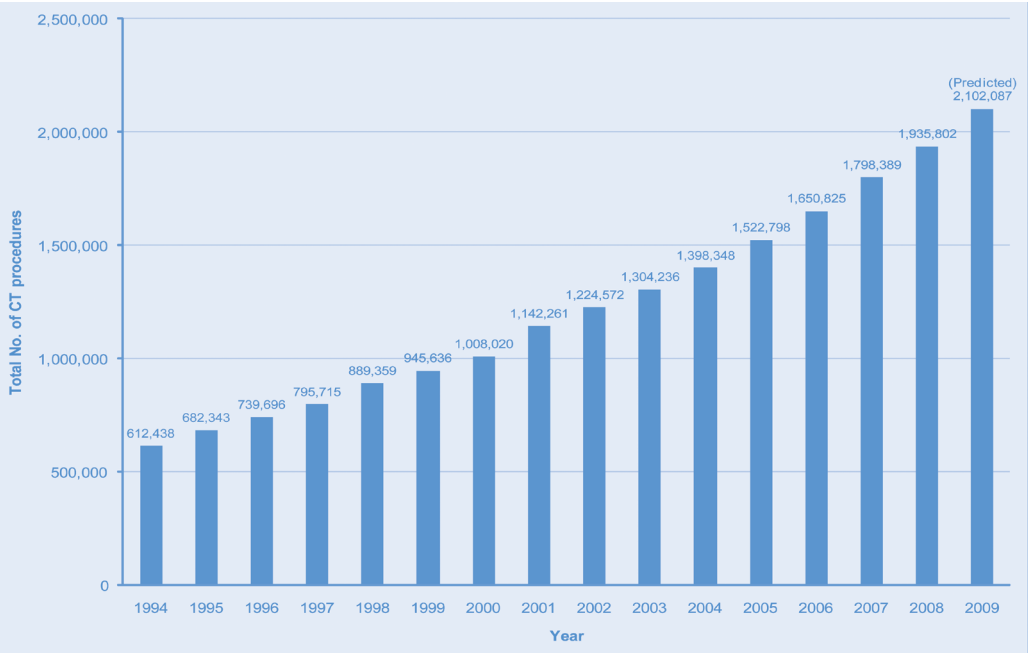
During 2008-09, ARPANSA began development of a web based MDCT survey to establish local practice, regional and national Diagnostic Reference Levels (DRLs) for MDCT dosimetry. The survey will also allow individual practices to obtain their own local practice DRLs for MDCT

enabling them to meet the requirement of the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* (ARPANSA 2008).

Following development of national DRLs, ARPANSA needs to develop the image quality expertise capacity and to help develop the expansion of service into MDCT optimisation programs. To enable development of this capacity and service, a new anthropomorphic MDCT imaging phantom was purchased during 2008-09.

To enable the national dosimetry survey to be comparative with other international work, a similar methodology of survey and calculation was adopted as that used by a recent European Union (EU) completed project. The EU and Medicare Benefits Schedule data were used to calculate generic population dose contributions for MDCT practice in Australia. It is estimated that the

Figure 2: Total Number of Medicare Benefits Schedule MDCT Procedures by Year for 1994-2009



population dose from MDCT has increased 160% over the past decade. The estimated per caput population dose from MDCT is approximately 1.2 mSv per annum.

To enable ARPANSA to estimate generic skin dose measurements for comparison with forthcoming survey data for both interventional and radiographic projections, new dosimetry equipment for X-ray system analysis, skin entrance dose measurement and dose area product measurement was purchased.

Assessment and development work was also undertaken for gafchromic film, a direct exposure technology that may be able to be used for skin entrance dose surveys for all X-ray modality imaging.

To discuss and facilitate the implementation of the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation*, ARPANSA initiated an ARPANSA/RANZCR Consultative Group (November 2008). Meetings with the Consultative Group have focussed on the development of the National DRL project for MDCT. ARPANSA has also sought and received approval from Royal Australian and New Zealand College of Radiologists (RANZCR) for the software survey solution that has been proposed.

### **Ionizing Radiation Standards**

As the holder of Australian measurement standards of exposure (air kerma) and absorbed dose for ionizing radiation, ARPANSA maintained appropriate reference facilities and carried out calibrations of various radiation dose measuring devices so that their measurements were accurate, reliable and traceable to the Australian standard.

During 2008-09, ARPANSA undertook the installation and commissioning of a state-of-the-art medical linear accelerator (linac) with the capability to perform the accurate calibration of radiation doses delivered to cancer patients by clinically applicable megavoltage radiation beams, both for current and emerging radiotherapy technologies.

An Elekta Synergy Platform, medical linac was delivered in October 2008 with an extended range of megavoltage X-ray and electron beam energies. A preliminary 6 MV photon beam was achieved and commissioning and acceptance testing continued through January 2009. ARPANSA liaised with the United Kingdom National Physics Laboratory (NPL) in early November to gain and share experience on the installation and acceptance testing of the NPL Elekta linac that is matched with the ARPANSA linac. A formal launch of the ARPANSA facility was held on 13 February and the facility was visited by the Parliamentary Secretary for Health at the end of March.

X-ray and electron beams are the basis of preliminary tests with the graphite calorimeter that is the Australian standard of absorbed dose. In order to establish megavoltage absorbed dose standards that will allow the direct calibration of reference dosimeters in radiotherapy treatment centres, measurements with the graphite calorimeter were made at scaled distances with a high degree of consistency. Baseline measurement of X-ray and electron beams were undertaken during the year.

In October 2008, several transfer standards were taken to the International Bureau of Weights and Measures in Paris for a comparison of low energy kV X-ray

standards. The excellent results supported ARPANSA’s participation in a recent Asia Pacific Metrology Program comparison. These comparisons re-establish the Australian primary standard of exposure (air kerma) that supports calibrations for ortho-voltage and superficial treatment services in radiotherapy.

Over the past year, using the existing cobalt-60 therapy source, 16 therapy reference ionization chambers were indirectly calibrated for 14 radiotherapy treatment hospitals. This is roughly one third of the number of therapy dosimetry centres in the country, consistent with maintaining a re-calibration period of three years for hospital dosimeters. The number of calibrations for therapy dosimetry for the years 2000-01 to 2008-09 is shown in Figure 3.

Apart from the therapy calibrations, the most common calibration was for protection level survey meters, doubling to 22 for 2008-09. A total of 87 calibrations were undertaken over the year, an increase of 24% over the previous year and distributed over several categories as shown in Figure 4. A large batch of personal dosimeters was also received. Five neutron meters were calibrated.

Dosimetry audits of therapy treatment centres, which assure the correct implementation of the calibrations supplied to the hospitals, have been curtailed this past year due to the activity related to the installation of the medical linac and the delay in the delivery of a new cobalt source. To date 45 X-ray beams from 24 accelerators have been audited since August 2007. This represents about a quarter of the number of therapy dosimetry centres in the country.

Figure 3: Annual calibrations for therapy dosimetry

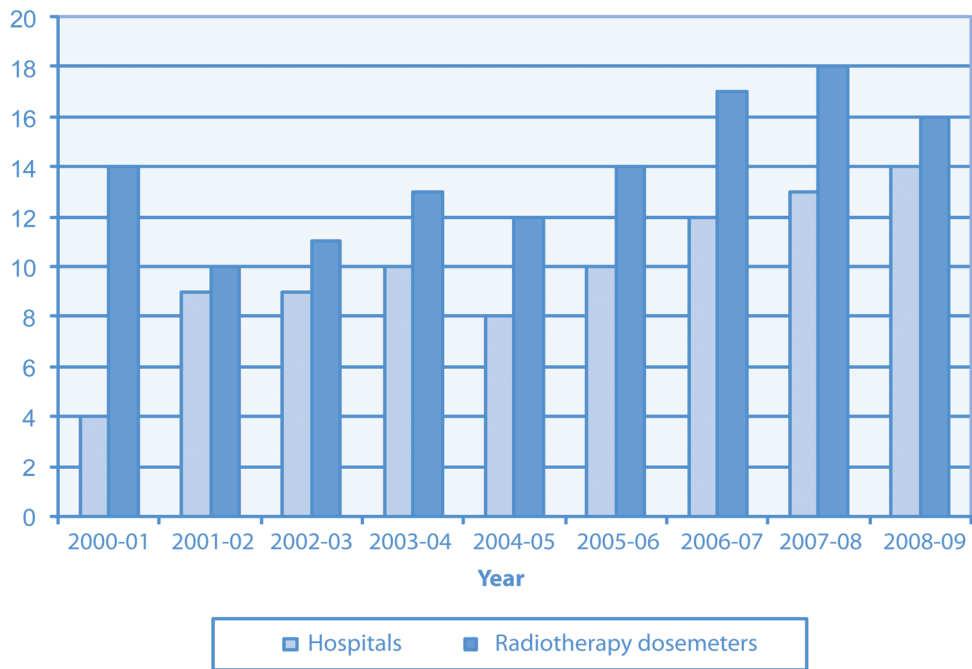
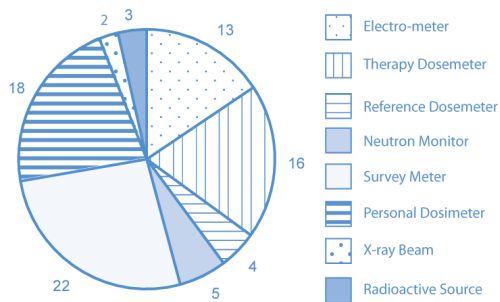


Figure 4: Ionizing radiation measurement calibrations 2008-09



### Radiopharmaceutical Quality Assurance

Due to the anticipated withdrawal from the market by the manufacturer of Instant Thin Layer Chromatography-Silica Gel for use in the radiochemical purity measurement of reconstituted 'cold kit' radiopharmaceuticals in the clinical environment, ARPANSA began working with the nuclear medicine professions to develop and validate rapid and easy-to-use alternative chromatographic methods.

Under a Memorandum of Understanding with the Therapeutic Goods Administration, ARPANSA conducted quality assurance testing of radiopharmaceutical used in nuclear medicine practice in Australia. An annual report of the results of this testing was produced to inform manufacturers and other stakeholders. The report is distributed to key stakeholders and posted on the ARPANSA website at [www.arpansa.gov.au/Publications/technicalreports/index.cfm](http://www.arpansa.gov.au/Publications/technicalreports/index.cfm).

### Personal Radiation Monitoring Service

ARPANSA's Personal Radiation Monitoring Service (PRMS) provided monitors to measure the radiation doses received by workers in the medical, dental, chiropractic, industrial and mining fields. The PRMS assisted in ensuring that ionizing radiation doses were monitored and controlled.

The PRMS has been in existence since 1932 and operates a quality system accredited to AS/ISO 17025 by the National Association of Testing Authorities. The PRMS participated in international intercomparisons of monitoring services through the auspices of the IAEA. The results of these intercomparisons have confirmed the quality of the service provided by the ARPANSA PRMS.

The PRMS uses a proven technology and fully meets the requirements of all Australian regulators. Four types of monitors were offered – standard monitors, special monitors for mining and other dusty environments, neutron monitors and extremity (finger) monitors.

The PRMS has over 151 000 people registered on its database and has about 26 000 active wearers throughout Australia, Papua New Guinea and other countries in the region. The database holds dose records for registered wearers stretching back to December 1986.

During 2008-09, 159 200 monitors were issued to 3074 centres. Development work on monitoring technologies and improvements to internal processing procedures was undertaken during the year. Following a review of investment needs and technology options, it was decided to re-invest in the existing technology used by the PRMS and to seek to purchase new upgraded equipment.

### Ultraviolet Protection Testing Service

The ultraviolet protection factor (UPF) testing service at ARPANSA, which tests the ultraviolet radiation (UVR) protection provided by clothing, issued redesigned UPF swing tags during 2008-09. The messages

on sun protection from the Australian Cancer Society and the New Zealand Cancer Society on the swing tags were updated and additional ARPANSA related activities and information were added.

During 2008-09, over 5 million of the new UPF swing tags, with updated messages were issued, bringing the total number issued to more than 48 million since 1992. In addition, testing and issuing of reports indicating the amount of UVR protection provided by shade cloth is also offered and over 80 such test reports were issued in the first year of operation.

Demand continued for the UPF testing, licensing and labelling (swingtag) program for fabrics and clothing. During 2008-09, 425 test requests were received which involved the testing of more than 1624 fabric samples. In addition, 98 UPF trademark licences were issued.

Accreditation of the service by the National Association of Testing Authorities was reconfirmed during 2008. Large international intercomparisons of UPF testing with outside organisations were carried out by the UPF Testing Service as part of the accreditation of external UPF testing agencies, to ensure accuracy of testing results. These intercomparisons provide detailed data on instrument performance and measurement uncertainties of external testing laboratories.

ARPANSA website

During 2008-09, there were 986 682 visits to the ARPANSA website. The most popular web pages were radiation and health information sheets and educational pages dealing with the basics of radiation science.

Visitors downloaded 153 019 documents, predominantly fact sheets about magnetic and electric fields of various frequencies and documents from the ARPANSA Radiation Protection Series (RPS). The two most downloaded documents from the RPS were the *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz* (ARPANSA 2002) and *Recommendations for Limiting Exposure to Ionizing Radiation (1995) and National Standard for Limiting Occupational Exposure to Ionizing Radiation* (ARPANSA republished 2002).

Ministerial Advice

ARPANSA is responsive to the achievement of outcomes expected by Government and works closely with ministerial advisers to respond effectively to the Government's policy agenda and to support the Parliamentary Secretary. ARPANSA does this by providing high quality technical information and policy advice in relation to radiation protection and nuclear safety. In addition, as set out in Table 5, ARPANSA prepared Ministerial and Parliamentary Briefing material, correspondence and reports.

Table 5: Details of advice provided 2008-09	
Ministerial Correspondence*	8
Ministerial Briefs	9
Minutes to the Minister	32
Question Time Briefs	11
Current Issue Briefs	11
Parliamentary and Senate Questions on Notice	7
* Excludes items marked for information	

**Table 6: Performance against PBS targets – Output Group 2**

Indicator	Reference Point or Target
Increased awareness of the medical, occupational and ambient radiation exposure of Australians through radiation programs and surveys.	Data collection and analysis of patient doses in computed tomography by June 2009
	Ongoing publication of results from personal UV radiation dosimetric studies in targeted population groups
	Publication of residential survey of ELF magnetic fields by December 2008
	Measurement and modelling to support implementation of proposed ELF standard by June 2009
	Position paper on surveillance strategies to monitor public exposure to environmental and residential electromagnetic radiation by end of 2008
<b>Indicator substantially met:</b> Development of a web based survey for patient doses has begun and is discussed in this report. Four publications were produced in relation to personal UV radiation dosimetry. The publication of the ELF Standard did not occur; publication is now expected in the first half of 2010. Measurement and modelling methodology was not completed but will be in place to support implementation of the ELF Standard. The position paper has not been completed; key components of the strategy to monitor public exposure to electromagnetic radiation were formulated.	
Accurate dissemination and maintenance of the Australian primary and secondary standards of measurement of the quantities of exposure and absorbed dose for ionizing radiation	At least half of all Australian radiotherapy centres participated in the ARPANSA national therapy dosimetry audit by June 2009
	New medical linac installed and commissioned and direct mega voltage dosimetry calibration procedures developed by June 2009
<b>Indicator substantially met:</b> About one quarter of the number of therapy dosimetry centres in the country participated in the national audit. The new medical linac was installed and commissioned, and development of calibration procedures and reference standards commenced.	
Quality, relevant and timely services provided in support of radiation protection	Maintain National Association of Testing Authorities accreditation
	Perform service within agreed times
	Undertake proficiency testing of services
<b>Indicator met:</b> Accreditations have been maintained and stated performance targets met.	
Assessment of the impacts of radiation exposure on the environment. Measured through the development of models associated with environment protection	Review existing national and international models substantially progressed by June 2009
<b>Indicator not met:</b> Work on this project began at the end of 2008-09.	
Expanded protection of the public from radiation exposure. Measure through the development for the assessment of radiation exposure from radioactivity in the environment and monitoring program to assess specific pathways	Draft safety guide for the assessment of occupational doses in uranium mining by June 2009
	Development of architecture for a national dose register for radiation workers by June 2009
<b>Indicator substantially met:</b> A draft structure and layout of the safety guide was completed in May 2009 following stakeholder consultation. The first draft of the safety guide was completed on 30 June 2009. The technical specifications and architecture design of the Dose Register were completed in March 2009. Construction of the Register began in May 2009.	
Quality, relevant and timely advice for Australian Government decision-making measured by Ministerial satisfaction	Ministerial satisfaction
<b>Indicator met:</b> Parliamentary Secretary to the Minister for Health expressed satisfaction with advice provided.	



## Output Group 3 – Regulation of Commonwealth Entities Using Radiation Sources and Facilities or Nuclear Installations

### National Uniformity

#### Radioactive Waste Management Framework

During 2008-09, ARPANSA undertook four principle pieces of work in relation to radioactive waste: reporting Australia's compliance with the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management; developing an Australian classification system for radioactive waste; publication of a safety guide for the predisposal management of radioactive waste and establishing uniform disposal limits for very low level radioactive waste.

As part of Australia's commitment to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, ARPANSA prepared a national report on Australia's compliance with the Convention. The report was prepared in consultation with the States and Territories and relevant Commonwealth agencies. This was Australia's third national report having previously reported in 2003 and 2005. The Report was reviewed by the contracting parties to the Convention which totalled forty-eight at the third review meeting held in May 2009. The review process included submission of written questions and answers in relation to national reports as well as presentation and direct discussion. Australia reviewed the national reports of 14 contracting parties.

ARPANSA led the Australia delegation to the review meeting. Australia's report to the

Review Meeting was well received and noted the good practices and challenges identified through the review process. The National Report and the questions and answers relating to the report were posted on the ARPANSA website at [www.arpansa.gov.au/Regulation/Collaborations/jointconv.cfm](http://www.arpansa.gov.au/Regulation/Collaborations/jointconv.cfm).

During 2008-09, work progressed on the development of a national classification system for radioactive waste. Draft recommendations for the classification of radioactive waste were finalised in early June for the consideration of Australia's State and Territory radiation regulators as to whether they were suitable to be released for public comment. The draft sets out a general scheme for classifying radioactive waste that is based primarily on considerations of long term safety and disposal of the waste. The draft recommendations identify the conceptual boundaries between different classes of waste and provide guidance on the definition of the different classes of waste on the basis of long term safety considerations. They will assist in the development and implementation of appropriate waste management strategies, and will facilitate communication and information exchange within and among jurisdictions. The draft is consistent with the new IAEA classification of radioactive waste which ARPANSA contributed to through its membership on the IAEA Waste Safety Standards Committee.

*The Safety Guide for the Predisposal Management of Radioactive Waste* (ARPANSA 2008) was approved for publication by the Radiation Health Committee and endorsed for adoption by the Radiation Health and Safety Advisory Council during 2008-09. The planned accompanying code of practice was found not to be required as it would have

duplicated many of the measures currently in place through a variety of legislation and other national standards.

Disposal limits for very low level radioactive waste currently varies across Australia. ARPANSA, through the national uniformity process, is developing an updated set of discharge limits that is in accordance with current exposure models and includes radionuclides that were not in use at the time of writing the previous national code of practice, the *Code of Practice for the Disposal of Radioactive Wastes by the User* (NHMRC 1985). Progress in the establishment of updated national limits for the disposal of very low level radioactive waste by small users was affected by the revised strategy for development of new editions of the *National Directory for Radiation Protection*. The strategy requires the development of individual amendments to the National Directory rather than a consolidated set of amendments so that the accompanying regulatory impact statement is specific to a particular amendment rather than an entire edition. As a result, although a schedule in relation to disposal of very low level wastes was developed, the accompanying regulatory impact assessment was not completed and a public consultation process was not undertaken. Approval by Ministers is also required before the proposed schedule can be included in the National Directory for adoption by State and Territory radiation regulators.

Monitoring Compliance with the ARPANS Act and with Licence Conditions

ARPANSA’s regulatory compliance policy includes promotion of compliance with the ARPANSA legislation, verification of compliance through inspections and quarterly reporting and, in addition, identification of good practices and promulgation of these through education and awareness sessions.

Inspections

The 2008-09 inspection work program was determined on the basis of the residual risk following an assessment of the risk profile of each licence holder. The parameters that make up this risk profile include the characteristics for each radiation source, facility or nuclear installation, the management systems and processes associated with their use as well as an entity’s track record of compliance with the conditions of its licence. On the basis of the inspections undertaken, shortcomings can be investigated and rectified by the licensee and better practices can be identified and disseminated to other sites primarily through the use of ARPANSA’s Regulation and Licensing web page ([www.arpansa.gov.au/Regulation/index.cfm](http://www.arpansa.gov.au/Regulation/index.cfm)).

As a consequence of the increased effort in inspecting regulated entities over recent years (see Table 7), licence holders have been made more aware of any shortcoming in their responsibilities to achieve compliance with the

Table 7: Number of inspections undertaken between 2006-07 and 2008-09			
	2006-07	2007-08	2008-09
No of Inspections	34	63	66



ARPANS legislation and this is reflected in the number of breaches identified.

Breach of the ARPANS Act

Controlled persons can be found to be in breach of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the ARPANS Act) by undertaking an activity that required a licence or exemption from licence under the ARPANS Act when no licence or exemption was obtained to authorise their activities; and those that were found to have failed to comply with any licence conditions that were imposed on their licence.

The 42 breaches of the ARPANS Act identified during 2008-09 all related to non-compliance with licence conditions. In relation to each breach, corrective actions were undertaken by the licensee and as a consequence no enforcement action was initiated by the CEO of ARPANSA. Table 8 provides the number and type of breaches of the ARPANS Act during the year compared to previous years. These results are assessed later in this report.

Details of those controlled persons found in breach of the ARPANS Act 1998 is set out in Appendix 6.

Enforcement

Where a breach of the ARPANS Act was discovered, the CEO of ARPANSA considered whether or not to take any enforcement action under the Act. In each case, it was considered that formal enforcement action, such as a direction, suspension or cancellation of the licence was not warranted in consideration of the circumstances of the breach. In all cases, the licence holder took appropriate corrective action to mitigate and rectify the breach in a timely manner.

Measurement of Key Performance Indicators

A comprehensive performance management system is in place involving a range of key performance indicators (KPIs) which set annual targets and measures for performance.

These KPIs were tracked in the regulatory management information system and were regularly monitored. This current system has been in place since 2007 and was regularly revised and improved in light of operational experience.

Table 8: Number and type of breaches of the ARPANS Act between 2006-07 and 2008-09			
	2006-07	2007-08	2008-09
<b>Unlicensed activity</b>			
s30(1) (Nuclear installation or prescribed radiation facility)	1	-	-
s31(1) (Controlled material or controlled apparatus)	4	3	-
<b>Failure to comply with licence conditions</b>			
s30(2) (Nuclear installation or prescribed radiation facility)	1	-	2
s31(2) (Controlled material or controlled apparatus)	-	4	40

Table 9 is a selection of the most important of the KPIs and the results for 2008-09.

All but one of the targets for the year were achieved. The target which was not met related to the number of breaches of legislative requirements. There were 42 breaches recorded against a target of 20.

Specifically referring to the type of breaches indicated in Table 8, 'Unlicensed Activity' decreased while the number of reported breaches related to instances of 'Non-Compliance with Licence Conditions' significantly increased. This predominantly reflects an increase in compliance activities related to an expanded inspection program and reporting of breaches by licence holders as well as an increased emphasis on reminders and guidance to the licence holders.

The breaches predominantly occurred in a small number of categories including ten being due to the disposal or transfer of controlled material or apparatus, eight for failing to comply with safety procedures and seven due to late submission of quarterly reports.

These particular performance measures have only been in place for a short time and the initial targets were to some extent only arbitrarily estimated and are subject to review with the experience of several years of data.

**Table 9: Summary of Annual Measures and Targets – 2008-09**

Measure	Annual Target	Result 2008-09
<b>Effectiveness</b>		
Accidents that must be reported within 24hours (Reg 46)	< 5	4
Other incidents	< 35	12
Breaches – Unlicensed	< 5	-
Breaches – Failure to comply with licence conditions	< 20	42
Applications for Facility Licence	-	3
Application for Source Licence	-	6
Requests for Approval (Regs 51, 53, 54)	-	27
Licences issued	-	8
Licences amended	-	53
Announced Inspections	>50	50
Unannounced Inspections	>10	16
<b>Efficiency</b>		
Number of inspection and assessment reports per staff member	> 7	11.3

## Assessment of applications for licences under the ARPANS Act

Key regulatory assessment activities (applications for licence; requests for approval)

### *High-flux Australian Reactor (HIFAR) (Facility Licence F0184)*

The CEO of ARPANSA issued a facility licence authorising the Australian Nuclear Science and Technology Organisation to possess or control the HIFAR on 15 September 2008. The purpose of the facility licence is to authorise ANSTO to place HIFAR in a state of safe enclosure, following its final shutdown in January 2007, and prior to ANSTO obtaining an authorisation for HIFAR's eventual decommissioning.

### *Open Pool Australian Lightwater (OPAL) Reactor (Facility Licence F0157)*

ARPANSA monitored the operations of the OPAL reactor during 2008-09 through a program of planned announced and unannounced inspections. In addition, ARPANSA approved a large number of requests for modifications of reactor systems during this period as a consequence of Regulation 51 which requires a licence holder to obtain the prior approval of the CEO of ARPANSA before making a relevant change (including a modification to the facility) that will have significant implications for safety.

A priority for ARPANSA during the reporting period was to monitor the implementation of the OPAL Business Management System and the status of its maintenance program and closure of events identified in its event management system. Quarterly review meetings were held with

key OPAL staff to ensure that all matters relevant to the safe operation of the reactor were monitored and discussed during this period.

### *MOATA Reactor (Facility Licence F00044-6A)*

During 2008-09, ARPANSA approved the preliminary dismantling of the MOATA reactor. The MOATA reactor was shut down prior to the commencement of the ARPANS Act and obtained a facility licence authorising ANSTO to decommission the reactor shortly after the commencement of the ARPANS Act. All fuel has been removed from this reactor. Under its facility licence authorising decommissioning, ANSTO requested that ARPANSA consider the dismantling of MOATA in two stages.

During 2008-09, ARPANSA approved pre-dismantling activities to be undertaken. The next stage will be a request for approval to dismantle the bio shield of the reactor.

## Export of High Activity Radiation Sources

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 authorises ARPANSA officers to approve export permissions. In accordance with this authorisation ARPANSA issued eight permissions.

## Importation of Radioactive Materials

The importation of radioactive material into Australia requires permission under Regulation 4R of the *Customs (Prohibited Import) Regulations 1956*. These Regulations

are made under the *Customs Act 1901*. Under the *Customs (Prohibited Import) Regulations 1956* the Minister for Health and Ageing authorises ARPANSA officers to approve import permissions. In accordance with this authorisation ARPANSA issued 485 permissions for Customs release of non-medical radio isotopes comprising 269 urgent single shipment, 196 standard single shipment, and 20 twelve monthly permissions. ARPANSA officers also issued 735 permissions for medical radio isotopes including 19 urgent single shipments, 691 single shipments and 25 twelve month permissions.

### **Liaison with Licence Holders and the Public on Matters of Regulatory Interest**

#### **Stakeholder Consultation**

ARPANSA held a Licence Holder Forum on 10 December 2008 at the Commonwealth Scientific and Industrial Research Organisation in Canberra.

The purpose of the Licence Holder Forums is to enhance communication between ARPANSA and its licence holders. The specific purpose of this forum was to assist licence holders to understand the requirements of the *Code of Practice for the Security of Radioactive Sources* (ARPANSA 2007)

The forum was well attended and well received. A survey conducted at the forum indicated that a majority of attendees rated its conduct and its value to them highly.

### **Continuous Improvements of Regulatory Business Processes**

ARPANSA acknowledges its responsibility as a provider of quality regulatory and policy services. To this end, ARPANSA is implementing an upgraded quality management system to assist it meet the needs of stakeholders and improve management of Regulatory and Policy Branch. The quality system is documented in a quality manual that defines policies and procedures and responsibilities. The quality system is consistent with the *ARPANSA Corporate Quality System* which in turn has been designed to meet the requirements of AS/NZS ISO 9001:2000.

The quality management system provides an assurance to our stakeholders that regulatory and policy processes are open and accountable and services are provided in an effective and efficient manner that is subject to continuous improvement.

During 2008-09, the regulatory quality management system was revised and improved to ensure that the regulatory processes were managed according to a comprehensive system which met the ISO 9000 standard. A quality committee met each month to ensure suitable progress of this review. Significant progress was made in 2008-09 with the development and documentation of the scope of services and management of services documents and identification and development of policies and procedures that required updating.

**Table 10: Performance against PBS targets – Output Group 3**

Indicator	Reference Point or Target
Nuclear installations, radiation facilities, apparatus or radiation sources used by the Australian Government are operated in accordance with licence conditions. Measured by the number of incidents.	Less than 40 incidents per annum in total
	Less than 5 accidents requiring reporting within 24 hours
<b>Indicator met:</b> There were 16 incidents in total. There were 4 accidents requiring reporting within 24 hours.	
Regulatory processes are efficient. Measured by the number of licence and relevant change assessments and inspection reports per staff member.	Greater than 7 assessments and inspection reports per staff member per annum.
<b>Indicator met:</b> 11.3 reports per staff member were completed.	
Development of a framework for national uniformity in radioactive waste management. Measured by completion of elements of the framework.	Publication of revised user disposal for Radiation protection by December 2008
	Publication of <i>Safety Guide for the Predisposal Management of Radioactive Waste</i> by December 2008
	Australian input to the final draft of the IAEA classification of radioactive waste by October 2008
	Final draft of waste classification specific to Australia submitted to the Radiation Health Committee meeting in June 2009
	Production of Australia's 3 <sup>rd</sup> National Report on Australia's compliance with the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management by October 2008
<b>Indicator partially met:</b> A draft schedule to the <i>National Directory for Radiation Protection</i> for disposal of radioactive waste by the user has been produced. The <i>Safety Guide on Predisposal Management of Radioactive Waste</i> was published in September 2008. A draft of an Australian classification for radioactive waste has been completed. The third National Report on the Joint Convention was submitted in October 2008.	
Regulatory stakeholders are satisfied with performance as identified through surveys.	Greater than 80% of stakeholders satisfied
<b>Indicator not assessed:</b> The 2009 annual survey is to be conducted during the Licence Holder Forum planned for September 2009.	

# Service Charter and Data

## Service Charter

ARPANSA has committed to a service charter that sets out the standards of service that all stakeholders can expect from the Agency. Amongst other things the charter provides a complaints resolution mechanism and is available in full on the ARPANSA website at [www.arpansa.gov.au/AboutUs/corporate/servicecharter.cfm](http://www.arpansa.gov.au/AboutUs/corporate/servicecharter.cfm).

# Client Complaints

As part of the quality management system of ARPANSA services accredited by the National Association of Testing Authorities, all corrective actions arising from client complaints are recorded. In accordance with the quality system, these actions are reported to the ARPANSA Quality Manager and the relevant Branch Director. Details of complaints received during the year which required corrective action are shown in Table 11.

Table 11: Details of client complaints received for ARPANSA accredited services in 2008-09			
Activity	Client complaints recorded	Category of complaint	What complaints were made
Medical import permits	None		
Ionizing radiation calibrations	None		
Radiofrequency calibrations	3	Business	Lack of detail on invoice Delay in answering enquiry Failure to provide certificate with instrument
Ultraviolet protection factor testing	1	Business	Not satisfied with report
Radioanalytical services	1	Business	Incorrectly labelled report cover sheet
Radiopharmaceutical quality assurance	None		

***Part 4:* Essay – What Contribution Can National Diagnostic Reference Levels Make to Australian Radiology Practice and Population Dose Burden?**



# What Contribution Can National Diagnostic Reference Levels Make to Australian Radiology Practice and Population Dose Burden?

## Introduction

It is well recognised that the greatest source of patient dose from diagnostic imaging is from multi-detector computed tomography (MDCT) [1].

MDCT has many advantages to offer radiology investigations and its uses and applications are significantly increasing. The rapidly increasing growth of applications of MDCT scanning has the unwanted outcome of a significant increase in population cumulative effective dose [2]. The development of the technology in terms of its power, flexibility, utility, ease of use and image quality has resulted in an exponential increase in its application in virtually all fields of clinical practice. While the dose to the individual and the consequent risk is relatively low, the increasing imaging and therapeutic applications across the population is becoming an increasing public health concern due to the escalating risks of the expression of stochastic effects<sup>1</sup>.

Although the application of MDCT to diagnosis and therapy should always be applied in the sound knowledge of benefit outweighing risk, its application does increase the probability of carcinogenic disease and genetic mutations (stochastic effects) in the population [3]. Radiobiology research also points to the increased risk of stochastic effects for children compared with adults [4]. It should be noted that stochastic risk is best

assessed epidemiologically for a population and consequently, the application of stochastic risk coefficients to the individual undergoing a radiological procedure is inappropriate. To reflect the variability in these statistically generated risk coefficients, the application of radiation protection philosophy is, of necessity, conservative, due to a lack of individual quantitative dose-response data [5] and the 'as low as reasonably achievable' (ALARA) principle should be adopted [6]. As the expression of stochastic detriment takes many decades to appear, we may only be at the threshold of an increasing MDCT induced cancer rate [7].

To assist with the efficient application of ionizing radiation in medicine it has become common practice for regional dosimetry surveys to be undertaken to measure the spread of doses that are used for similar radiological investigations across various institutions. This range of average doses is statistically ranked and a value<sup>2</sup> is calculated that represents a dose that 75% of practices may deliver to accomplish the particular procedure. The agreed value is termed the Diagnostic Reference Level (DRL) and is conditional upon its application resulting in an adequate diagnostic quality image. By definition, 75% of all surveyed practices can achieve a diagnostic outcome for a dose that is at or below the calculated value.

The development of dose reference levels for common radiology procedures has been ongoing for the past two decades. The DRLs provide practices with a measure against

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<sup>1</sup> Carcinogenic disease and genetic mutations arising from the exposure to ionizing radiation are referred to in radiation protection as 'stochastic effects'.

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<sup>2</sup> 75<sup>th</sup> percentile.



which to compare their own practice doses with those of their peers and may provide an indication for the need of some modification of imaging protocol to optimise the dose. This process of individual site and regional/national comparison is undertaken on a regular basis.

The UK introduced dose reference levels in 1990 as an indicator of 'abnormally high doses'. They used the 75 percent value of the mean dose distributions taken from a national dose survey in the mid-1980s. If the practices' mean dose consistently exceeded the reference dose then an investigation should have been undertaken to establish the cause and take corrective action if the doses are found to be clinically unjustified. The UK data has been updated periodically, every five years, for the past 20 years and each review has led to a reduction in the previously published MDCT DRL [8]. The next review (2009-10) will be the fifth iteration of the process.

The International Commission on Radiological Protection (ICRP), in Publication 73, first coined the term 'diagnostic reference level' (DRL). They have long enunciated the need to establish diagnostic reference levels in radiology as a key step towards addressing the ALARA principle [9].

Unfortunately, the development of DRL practice in diagnostic radiology within Australia is still at an early stage as no national surveys have been carried out for any radiological examinations for the express purpose of establishing national DRLs. Various organisations, regulatory authorities and individual practices have carried out limited CT dose surveys [10].

## Population Risk

The contribution of radiation dose from radiological investigations to the population is increasing. This is due to the following reasons:

- The increasing power, utility and applications of the various imaging platforms.
- The increasing number of procedures, including those which may now be attempted non-surgically.
- The increasing referral base from physicians and surgeons.
- The increasing number of screening programs initiated as a public health response.

While the radiation risk to the individual from a radiology procedure is very small, the consequent population risk from the steadily increasing number of radiology procedures is of consequence. If the linear no threshold (LNT) model of radiation detriment is a reasonable representation of the risk then the tens of thousands of person-sievert delivered each year from radiology procedures should carry with it some additional potential long-term risk of carcinogenesis to the population. The LNT theory of carcinogenesis is based on the risk of DNA mutations deriving from cellular effects in germ cells. This additional stochastic risk should be compensated by the benefit of undergoing the investigation in either confirming the presence, or absence, of underlying disease, or therapeutic intervention.

## Dose & Image Quality

A complicating factor in the use of the ALARA principle in diagnostic imaging

is that any variation in delivered dose will have a consequent impact on diagnostic image quality. So it is not appropriate to simply 'turn down the wick' and reduce dose. Appropriate levels of diagnostic image quality must be maintained. The first cost of any non-diagnostic scan is usually a repeat scan which immediately negates any initial dose saving strategy.

In diagnostic imaging it is of critical importance to recognise that:

- Dose and image quality are opposite sides of the same coin and cannot be separated.
- The minimum required outcome of any imaging investigation is a diagnostic quality image.
- A diagnostic quality image can be achieved with a range of doses.
- This range of dose is amenable to an optimisation process where a diagnostic image can be obtained for a reasonable radiation risk.

## Digital Imaging

The introduction of medical digital imaging technology has had a significant impact on the potential for higher dose delivery. Previously, with film-screen technology, there was a very small window of dose required at the film plane, outside of which a non-diagnostic film was delivered. As the acquisition media was also the display media, i.e. the film, there was immediate visual feedback about the over- or under-exposure of the film. Poor quality imaging necessitated a repeat exposure. Indicative repeat numbers for larger film-screen practices were around 10-15%. However, with digital technology there is a complete separation between the

acquisition device (the computed radiography or flat panel plate) and the digital image processing hardware and software that manipulates the image data for diagnostic interpretation.

Due to the separation of the acquisition device from the presentation device, combined with digital manipulation, under exposed images can be scaled up (signal amplified) and previously over exposed images can be scaled down to display images of reasonable diagnostic quality. This is not to say that there is not some image quality impact on scaling up under exposed images. The principal cost being an observable increase in image noise, speckle or mottle, which may or may not impact diagnostic quality. The main risk lies with over exposed acquisitions which can be automatically 'adjusted' to display, what seems to be, on a simple visual interpretation as, a diagnostic and aesthetically pleasing image. The higher dose reduces noise in the image, may improve contrast but does not necessarily present any more diagnostic information. As the business of radiology is to produce images, there is a strong tendency to subtly improve the presentation quality by increasing the dose. This is the well recognised phenomena of 'exposure creep' [11], which can be easily countered by local periodic dose surveys.

## Survey

To obtain a clearer assessment of the risk it is imperative that a review of the doses delivered from common radiology procedures is undertaken both at the site of practice and consolidated into a regional or national analysis. DRLs can then be constructed and used as a comparative indicator of radiation efficiency at the

practice, regional, national and international levels. Once site DRLs are established they can be regularly reviewed and used as a baseline for the implementation of an optimisation program to maximise the efficient use of radiation while maintaining diagnostic image quality. Regional and national DRLs can be obtained and reviewed over a longer period and used as a dose benchmark that 75% of practices will be able to achieve. As multiple iterations of the DRL review are undertaken, it is expected that the spread of doses per procedure should decrease and the resultant 75<sup>th</sup> percentile value would reduce.

Using the 75<sup>th</sup> percentile as the indicative measure means that there will always be 25% who do not meet the DRL. This is why DRLs are not to be used as limits but simply as indicators of common practice. There may be good clinical reasons why a practice and/or protocol exceeds the accepted DRL. It is the responsibility of the practice to be able to justify, post-optimisation, the dose used for a particular procedure or protocol.

## Optimisation

Successful optimisation is the process where a balance is achieved between minimising the dose delivered and maintaining adequate diagnostic image quality. It is a multidisciplinary and labour intensive task that requires a detailed understanding of:

- image quality
- dosimetry
- imaging system parameters.

It can be undertaken using the simple method of dose survey, review of imaging equipment protocol parameters, image review, protocol adjustment if required

followed by dose and image quality re-survey to establish a successful optimisation outcome. This process is carried out for each modality and for each of the agreed protocols for that modality. The consequent doses are recorded and the average dose is displayed as the local reference level for that procedure. Regional and national DRLs can be built up from practice data and used for international reference.

## ARPANSA and National Surveys

ARPANSA has been charged with carrying out national DRL surveys for the Australian Government. ARPANSA is cognisant of the fact that DRLs should be owned by the respective professions and can only be constructed with appropriate consultation and buy in from the relevant stakeholders. Consequently, ARPANSA will be working with Royal Australian & New Zealand College of Radiologists, Australasian College of Physical Scientists & Engineers in Medicine, Australian Institute of Radiography, Australian & New Zealand Society of Nuclear Medicine, Department of Health & Ageing and the various State Regulators.

A working group will be sponsored by ARPANSA to establish and roll out the survey program. The initial focus will be on MDCT, the major dose contributor from diagnostic radiology procedures. There are expected to be well over 2 million MDCT investigations undertaken nationally in 2009 ranging in dose from approximately 1 to 40 mSv per protocol [12].

It is proposed that the MDCT survey will be based on the parameters of dose length product (DLP - mGy.cm) taken from the

MDCT console, patient weight, height and width at an agreed anatomical landmark. This will be recorded for 20 patients, for seven common protocols, for as many sites as wish to participate. It is estimated that there are approximately 1000 MDCT platforms registered/licensed in Australia. It is a condition of the ARPANSA *Code of Practice - Radiation Protection in the Medical Applications of Ionizing Radiation* (RPS14), that practices must know their doses and be able to compare them to existing DRLs [13]. This requirement will be taken up by the various state radiation regulators into their conditions of registration/license for X-ray emitting apparatus by the end of 2009. This will essentially make the development of local DRLs a mandatory requirement at all practices.

To assist with the development of local DRLs ARPANSA will provide a web based survey form where practices can log their dose data and receive a calculated practice DRL to comply with RPS 14. ARPANSA will then log the practice data into the national DRL database. ARPANSA will develop the portal, database & statistical software and reporting systems.

When the MDCT DRL survey is satisfactorily rolled out ARPANSA will then expand into DRLs for interventional fluoroscopy, general radiography/fluoroscopy and mammography.

## Comparative European Data

The European Commission has recently published DRL survey data from 10 countries [14]. In the interests of data consistency and comparative analysis ARPANSA has decided to replicate their

method. Using current Medibank Benefit Schedule statistics for MDCT services and generically calculated MDCT dosimetry ARPANSA has calculated that Australian MDCT dosimetry is in the upper quartile of European values [12]. These figures are yet to be verified but are none the less disappointing and strongly point to the need to carry out a survey for verification and, if established, require the urgent roll out of a national MDCT optimisation program.

## Conclusion

It is assumed that radiologists are satisfied with the diagnostic image quality demonstrated by their various imaging platforms. Comparing European dose data with generic Australian dose data leads to the question, 'At what dose cost are these images being produced and has the process been optimised?' The answer to this question can be found with a comprehensive national dose survey of radiological practice. ARPANSA has a pivotal role to play in this process and is currently developing the methods and relationships to achieve this goal.

The development of Australian DRLs will provide a measure of the efficiency with which radiation is used in diagnostic radiology and provide a measure that can be used to optimise its application. The successful introduction of this process will assist in the establishment of best practice radiology and consequent dose savings to the Australian population.

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## ***Part 5: Management and Accountability***



## Corporate Governance

### Corporate Governance Practices

ARPANSA's role, functions and powers are defined by the *Australian Radiation Protection and Nuclear Safety Act 1998* (ARPANS Act). ARPANSA is constituted by the Office of the CEO, created by the ARPANS Act, who is authorised to engage employees under the *Public Service Act 1999* (the Public Service Act). ARPANSA is a statutory agency for the purpose of the Public Service Act and a prescribed agency under the *Financial Management and Accountability Act 1997* (FMA Act).

The CEO reports to the Parliamentary Secretary to the Minister for Health and administers the following Acts:

- *Australian Radiation Protection and Nuclear Safety Act 1998*
- *Australian Radiation Protection and Nuclear Safety (Consequential Amendments) Act 1998*
- *Australian Radiation Protection and Nuclear Safety (Licence Charges) Act 1998*.

ARPANSA has an integrated corporate governance framework designed to provide a sound basis for decision making, to define the mechanisms for accountability and stewardship, to support the achievement of organisation goals and to ensure all legal and regulatory requirements are met.

### ARPANSA Management

The CEO and relevant senior executives allocated the resource budget, made strategic decisions and set key priorities through an Executive Board of Management. The members comprised the CEO, ARPANSA

Branch Directors and an external member from the Bureau of Meteorology. ARPANSA's Chief Financial Officer (CFO) and Corporate Counsel attend as observers.

During the year the position of Director Corporate Services was combined with the role of Corporate Counsel reporting directly to the CEO. The Corporate Counsel provides independent advice to the CEO on regulatory and operational matters.

The Executive Board met monthly in accordance with a formally approved timetable and agenda and dealt with strategic issues.

The CEO delegated various powers and functions to Branch Directors, and staff reporting to them, to ensure that ARPANSA business is carried out efficiently and effectively. The CEO requires his delegates to act in accordance with approved policies and procedures, including Chief Executive Instructions, formulated in accordance with the FMA Act. A program of mandatory formal training on various compliance issues was commenced for relevant staff during the year.

### Senior Management Committees

The CEO and senior executives met weekly, as a decision making body, to discuss high level administrative and operational matters. Additionally, a number of advisory committees support the CEO and Branch Directors in their management role.

#### Audit Committee

ARPANSA's Audit Committee comprised an independent chair, two senior managers from within ARPANSA and an external member.



Representatives of the Australian National Audit Office attended committee meetings as observers and the Agency's internal auditor, Oakton Services Pty Ltd, CFO, and Corporate Counsel attended meetings to report on particular matters. Branch Directors were also invited to attend on occasions to discuss particular audit reports.

The Audit Committee, through the internal audit program, assisted the CEO to maintain and improve:

- the effectiveness of the internal control framework
- the effectiveness of ARPANSA's risk management processes including business continuity and fraud control
- the quality of the financial management and reporting processes
- overall compliance with relevant legislation in particular the *Financial Management and Accountability Act*.

The Audit Committee met three times in 2008-09 and reported to the CEO after each meeting.

As well as considering audit reports, during the year the Audit Committee:

- developed and reviewed a risk based strategic three year audit plan
- maintained a program of self assessing its own performance and reviewing the performance of internal audit
- provided assurance to the CEO on the integrity of the Agency's Financial Statements and compliance processes.

The Australian National Audit Office provided external audit services, Oakton Services Pty Ltd provided internal audit services.

## Information Management Steering Committee

The Information Management (IM) Steering Committee met bi-monthly and was chaired by the Director of the Legal and Corporate Branch. The Committee comprised various Section Managers and the Information Management Manager. The Committee oversaw the continued implementation of the ARPANSA information management strategy; reviewed and approved IM and information and communication technology (ICT) policies; assessed, monitored and managed ICT risks and fostered the development of ICT skills and capabilities.

## Radiation Safety Committee

The Radiation Safety Committee reported to the OH&S Committee on matters relating to workplace radiation protection and safety.

## Occupational Health and Safety Committee

The Occupational Health and Safety Committee (OH&S) is chaired by the Director of the Medical Radiation Branch, assisted by the ARPANSA Health and Safety Coordinator, and comprises staff and management representatives. The OH&S Committee met every two months and reviewed and reported to the Executive Board of Management on relevant ARPANSA health and safety issues, on the effectiveness of ARPANSA's performance in these areas and compliance with relevant legislation in accordance with the ARPANSA OH&S Management System.

During the year the OH&S Committee conducted a number of OH&S work area audits. Further information in respect of

OH&S arrangements within the Agency is at Appendix 1.

### **Renovation Advisory Committee (RAC)**

The Renovation Advisory Committee was set up during 2008-09 to oversight the renovation of ARPANSA's Yallambie premises and has replaced for the foreseeable future the Work Environment Group which formerly dealt with minor upgrades and renovations.

It is chaired by the Director of Legal and Corporate Branch, and comprises staff representatives from the five Branches. The RAC advised and received input from staff on the large scale renovation plan for ARPANSA's Yallambie premises.

### **Corporate and Operational Planning and Performance**

The *ARPANSA Strategic Directions 2008-12* sets out strategic directions and key priority areas the Agency intends to focus on during the coming year and beyond. The Strategic Directions are supported by Branch operational business plans that describe the activities undertaken to accomplish those key priorities. Individual performance and development plans provide the framework for performance and accountability assessment. The framework is underpinned by management systems and strategies including internal audit, risk management, fraud control, compliance, business continuity, information management and quality.

The Executive Board of Management received a quarterly Performance and Accountability Report which highlighted progress against the key priority areas.

### **Internal Control**

The CEO must report annually to the portfolio Minister, by way of a certificate of compliance, on the financial management and financial sustainability of the Agency. The certificate requires the CEO to certify that, based on ARPANSA's internal control mechanisms, management assurance, and audit committee advice, it has:

- complied with the Australian Government's financial management framework and other specified Commonwealth policies
- operated within the agreed resources for the current year and has adopted, or will adopt the appropriate management strategies for all known risks that may affect the financial sustainability of the agency.

ARPANSA has a robust internal governance and control framework comprising formal plans, policies, instructions, and guidelines. The Agency has adopted the Compliance Self Assessment (CSA) methodology for annual compliance sign-off and developed a risk based compliance assessment questionnaire to guide management in their review. The annual CSA by management and internal audit review of the effectiveness of internal control mechanisms provided the assurances required to support the certification. Branch Directors were required to provide additional assurances and certifications regarding compliance for their areas of responsibility, and to report on any instances of non-compliance with the framework.

During 2008-09, eight minor breaches of the financial management framework were reported. Each breach was the result of

mistakes and was detected by ARPANSA's existing internal controls.

### **ARPANSA Quality System**

The ARPANSA Quality System employs two levels of management review. The first, at the Branch level, reviews the service activities of the Branch in detail, and the second at senior management level by the ARPANSA Quality Management Committee (QMC). The QMC, which comprises the CEO, Branch Directors and the Quality Manager and which acts under the auspices of the Executive Board of Management Charter, meets quarterly to review reports from the Branch quality meetings. The QMC has the overall responsibility for ensuring the services offered by ARPANSA are delivered in a manner consistent with the principles of quality and as set out in the ISO 9000 series of documents and ISO 17025.

Seven of ARPANSA's laboratories maintain National Association of Testing Authorities (NATA) accreditation and are regularly assessed by NATA against the above standards. During the year, NATA conducted technical re-assessments of the quality systems in place in each of the chemical testing laboratories.

As required by the Quality Standard, AS ISO/IEC 17025: 2005 all service activities were internally reviewed by qualified auditors selected from the ARPANSA Quality Assurance Team made up of representatives of the services. Operational procedures and aspects of the management requirements of the Standard were audited in accordance with an approved schedule.

### **Internal Audit**

During the year ARPANSA conducted an open tender to appoint outsourced providers of the internal audit function. In November 2008, Oakton Services Pty Ltd was appointed as ARPANSA's internal auditors replacing Protiviti Pty Ltd, who had been internal auditors for the previous three years. Significant internal audits conducted in 2008-09 included reviews of:

- contract management
- workforce planning
- effectiveness and efficiency of implementation of New Policy Proposals
- compliance with the FMA Act
- ARPANSA's fraud control plan.

### **Identification and Management of Risk**

Risk management is an integral part of ARPANSA's Corporate Governance framework. The Agency's business planning framework, including setting of performance targets for staff, is also underpinned by relevant risk assessment processes. Strategic and key operational or project risks are reviewed quarterly by the Audit Committee and monitored by the Executive Board of Management.

A fraud risk assessment was carried out during the year. Business planning templates were revised during the year to incorporate explicit risk assessment of planned activities and to facilitate improved risk reporting to the Executive Board of Management and Branch Risk Registers were reviewed.

ARPANSA retained its five star rating for risk management practices following insurer Comcover's risk management benchmarking survey in 2008.

### **Business Continuity**

The existing ARPANSA Business Continuity Plan is scheduled for a major review during the second half of calendar 2009.

### **Compliance with Commonwealth Fraud Control Guidelines**

ARPANSA reassessed its fraud risks, determined relevant risk mitigation strategies, and amended its fraud control plan for 2008-10. The plan is in accordance with the requirements set out in the ARPANSA Risk Management framework and in conformance with the *Commonwealth Fraud Control Guidelines 2002*. The plan outlined strategies and processes to detect, prevent, investigate and minimise the effect of fraud.

In accordance with the *Commonwealth Fraud Control Guidelines* ARPANSA provided the Annual Fraud Report to the Australian Institute of Criminology for the year ended 30 June 2009.

### **Ethical Standards**

All ARPANSA staff must adhere to the Australian Public Service Values and Code of Conduct under the *Public Service Act 1999*. ARPANSA actively promoted ethical standards among its staff by conducting annual training and awareness program on the Australian Public Service (APS) values and Code of Conduct. Additionally, a mandatory training program was developed

during the year commencing with modules on Bullying and Harassment and on Privacy.

A commitment to ethical standards is also highlighted in the *ARPANSA Agreement 2007-2010*, the *ARPANSA Strategic Directions 2008-12* and the *Workplace Diversity Program 2006-10* and are included in the induction packages provided to all new employees.

There are formal procedures to ensure disclosure of any real or apparent conflict of interest. Senior staff are required to disclose to the CEO all direct or indirect pecuniary interests in businesses and companies which may be affected by ARPANSA's decisions.

### **External Scrutiny**

Key external accountability institutions for ARPANSA include the:

- Commonwealth Parliament
- Commonwealth Auditor General, who is an officer of the Parliament
- Commonwealth Ombudsman
- Privacy Commissioner
- Administrative Appeals Tribunal
- Federal system of courts, including the Federal Court and High Court of Australia.

As required by the ARPANS Act, the following mechanisms for external stakeholder input to ARPANSA's processes are in place:

- Radiation Health and Safety Advisory Council
- Radiation Health Committee
- Nuclear Safety Committee.

Their activities for the current year are reported in Appendices 7 and 8 of this Report.

## **Management of Human Resources**

During 2008-09, ARPANSA continued to enjoy the organisational benefits of an effective and committed workforce. Employee commitment was evidenced by the relatively low staff turnover, as compared to other APS Agencies.

However, this level of staff retention did create a different challenge for ARPANSA. Due to the age profile of ARPANSA's staff, many scientific staff will retire over the next 5 to 10 years, this loss of experience presents a significant workforce planning challenge for the Agency.

ARPANSA commenced addressing these concerns in a number of ways including commencement of graduate program which has seen it take on six promising new employees over the last two years. ARPANSA has also focused on strategic people management with particular emphasis on human resources, workforce planning, learning and development and information communications for existing staff. Through the Executive Board of Management, ARPANSA has also continued to ensure that its people management policies and programs are directed at achieving the Agency's key service operations and corporate objectives.

In recognition of the ongoing need for the holistic management of staff performance ARPANSA is currently formulating a succession management process aimed

at developing staff at all levels for those roles crucial to achieving the organisation's outcomes.

During the year, each of the Branches held planning days with staff to review outcomes and the delivery of programs and to develop action plans. In addition, ARPANSA entered into contractual arrangements with an external provider to undertake an online benchmark survey of employees to gauge the organisational health of the Agency. The survey will be undertaken during 2009-10.

In 2008-09 ARPANSA reviewed and updated a number of its policies including: recruitment and selection guidelines

- harassment and bullying policy
- home based work policy
- outside work policy

to assess their effectiveness in meeting operational needs.

## **Strengthening the Alignment and Delivery of ARPANSA's Enabling Services**

The Agency's legal services and corporate services activities were consolidated during the reporting year to form the Legal and Corporate Services Branch.

The changes were implemented to strengthen the alignment and delivery of ARPANSA's enabling services with the Agency's Strategic Directions and to increase the Branch's capacity to more effectively provide services to ARPANSA.

## **Workplace Diversity**

During the year, ARPANSA continued to promote workplace diversity and reinforce the roles and responsibilities of all staff

in increasing awareness and acceptance of workplace diversity principles through fostering diversity and using the diverse range of skills, experience and cultural backgrounds of staff.

Underpinning ARPANSA's *Workplace Diversity Program 2006-2010*, is an implementation plan outlining various initiatives, responsibilities and outcomes. The Program sets standards for performance and accountability to meet objectives of having a productive and supportive workforce by providing a safe workplace, modelling shared behaviours, and offering equal opportunities for all employees.

The Program is linked to ARPANSA's Strategic Directions and aimed at creating an inclusive environment, which respects, values and uses the contributions of staff with different backgrounds, experiences and perspectives. The Program also assisted in promoting the APS Values across the Agency and ensured that employment decisions were based on merit.

In addition, ARPANSA has embarked on a major renovation program with ensuring access to all prospective employees as one of its key functions.

ARPANSA has harassment contact officers in both its New South Wales and Victorian offices whose role is to act as a source of information and support for staff. Harassment contact officers are appointed by the CEO and undergo regular refresher training. They have management support to carry out their responsibilities.

## **Prevention of Workplace Harassment and Bullying**

The Agency's refreshed *Respect-ARPANSA Policy for the Prevention of Workplace Harassment and Bullying* seeks to minimise harassment and bullying that may arise in the workplace. The policy provides information on the informal and formal approaches to resolving claims of harassment and bullying including the legislative framework; reinforces the role of the APS Values and Code of Conduct; broadens the concept of harassment by including definitions of bullying behaviours and clarifies the roles and responsibilities of managers and staff.

During the reporting period, all managers and staff were required to attend a familiarisation session on the prevention of bullying and harassment in the workplace aimed at reinforcing their obligations in supporting and upholding the policy.

## **Work/life Balance**

As in past years, ARPANSA continued to support a work environment that provided a reasonable work/life balance for all employees.

These initiatives included, access to flexible working arrangements, including flextime, job-sharing, part-time and home based work; extensive leave provisions including 4-weeks annual leave each year with the ability to take this leave at half pay, access to purchased annual leave, cumulative personal/carers leave, increased paid leave for maternity leave purposes for up to 14 weeks which can be taken at full or half pay, paid paternity/non primary care giver leave of up to 4 weeks,



parental leave, study leave as well as a range of miscellaneous leave entitlements which could be taken with or without pay.

### **Employee Support**

Converge International is the provider of the Employee Assistance Program for ARPANSA employees in Victoria while Davidson Trahaire Corpsych provides a similar service for New South Wales based employees.

Assistance was available to all ARPANSA employees and their immediate families with personal or work related problems that might affect their work or life. Both providers have many years of experience and are available to help employees clarify and/or resolve issues. The program is recognised as a valuable resource for managing personal and workplace difficulties.

### **Carer's Rooms**

ARPANSA provided a carer's room in its Victorian office and made provision to arrange for a carer's room in New South Wales at short notice. The rooms provide a temporary workplace for employees to carry out as much of their normal work as possible while caring for their dependents and family members for whom care is temporarily unavailable. The rooms provide a quiet, comfortable environment for a variety of uses including a facility for nursing mothers.

### **ARPANSA Staff Consultative Forum**

ARPANSA's collective agreement provided for a Staff Consultative Forum (SCF) as the key employee consultative process. The Forum comprised employees elected by staff,

officials from unions that are party to the ARPANSA agreement, the CEO and the Director of Legal and Corporate Branch.

During the year, the SCF met on three occasions to discuss a range of issues relating to the management of ARPANSA. Agenda papers and outcomes of meetings were provided to all staff.

Issues discussed and agreed included policies on study assistance, flextime and fitness for continued duty. The *ARPANSA's 2008-12 Strategic Directions*, amendments to the selection and recruitment guidelines, communication with external stakeholders and the Yallambie building renovations were also discussed.

Standing reports on the Agency's finances, activities of the OH&S Committee and matters considered by the Executive Board of Management were also provided and discussed at Forum meetings.

### **Workforce Planning, Staff Turnover and Retention**

ARPANSA continued to refine its workforce planning and development framework. The link between business planning and the skills and delivery requirements of the workforce continue to be strengthened and are now a crucial element of ARPANSA's business planning processes. They are used for determining capability levels and identifying short-falls between current skill levels and those required to meet ARPANSA's Strategic Directions.

At 30 June 2009, ARPANSA employed 146 staff; 141 of whom were employed on an ongoing basis. These staff were divided

between the Agency’s ACT and New South Wales (26%) and Victorian offices (74%). More detailed information about the nature and break-up of ARPANSA’s workforce, retention and turnover rates is set out in Tables 12 and 13.

## Training and Development

Effective and targeted training and development strategies are a fundamental element of ARPANSA’s ability to retain quality staff, and assist in the development of talent identification and succession management processes.

### Corporate Learning and Development

During 2008-09, ARPANSA reviewed its corporate learning and development (L&D) training framework. This review resulted in a more clearly focused L&D

program addressing the requirements for individual staff with those of their Branch and ultimately ARPANSA’s Strategic Directions whilst also providing staff with the opportunity of furthering their own development needs.

In the past year ARPANSA’s L&D has provided staff with work skills training and development opportunities to address identified individual development needs.

### Compliance Training

Consistent with the Government’s requirement for APS agencies to have appropriate measures in place to ensure adherence to their statutory and corporate governance compliance responsibilities, ARPANSA implemented a rolling program of compliance training during the reporting period.

Table 12: Staff retention and turnover 2007-08 and 2008-09										
Classification	Female				Male				VARIATION	
	Ongoing		Non-Ongoing		Ongoing		Non-Ongoing			
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
SES										
Commencement	-	-	-	-	-	1	-	-	-	+1
Separation	-	-	-	-	-	1	-	-	-	-1
Executive Level 1-2										
Commencement	3	-	-	1	5	6	1	1	+9	+8
Separation	1	1	-	-	9	2	-	-	-9	-3
APS Level 1–6										
Commencement	5	5	-	-	4	4	2	1	+11	+10
Separation	2	1	3	-	5	1	-	1	-10	-3



The training, which is mandatory for specific target audiences, was aimed at ensuring ARPANSA's operations are conducted transparently, accountably and utilise Commonwealth resources efficiently, effectively and ethically.

### Leadership Development

As with much of the APS, the issue of an ageing workforce within ARPANSA has been identified as a key issue in addressing its workforce planning strategies.

During 2008-09, ARPANSA entered into collaborative arrangements with the Australian Public Service Commission to develop a succession management strategy aimed at ensuring the availability and sustainability of a supply of internally capable staff; ready to assume key and/or critical roles.

This process has recently commenced and will be further progressed during 2009-10.

### Graduate Recruitment Program

The reporting year saw the commencement of a three graduates to undertake the

ARPANSA's graduate recruitment program. The program is an important component in ARPANSA's workforce planning and business planning processes and will provide the graduates with a series of structured learning and development opportunities. Specialised professional development through attendance at training courses, work rotations and mentoring by senior staff was undertaken.

The program is designed to increase the diversity and depth of talent in ARPANSA's workforce while introducing fresh ideas and attitudes. It will also address ARPANSA concerns about the number of ARPANSA employees approaching retirement.

In addition to rotating the graduates through a number of ARPANSA's branches, training sessions were held on: accessing online journals; the TRIM records management system; dosimetry devices; radiation safety; gamma spectrometry; security and fraud awareness; Chief Executive's Instructions procedural rules; project management; IT risk; and writing skills. These sessions were open to all ARPANSA staff who were also encouraged to attend as appropriate.

Table 13: Inoperative staff as at 30 June 2008 and 2009*										
Classification	Female				Male				TOTAL	
	Ongoing		Non-Ongoing		Ongoing		Non-Ongoing			
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
SES	-	-	-	-	-	-	-	-	-	-
Executive Level 1-2	-	-	-	-	2	2	-	-	2	2
APS Level 1-6	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	-	-	-	-	<b>2</b>	<b>2</b>	-	-	<b>2</b>	<b>2</b>
*Inoperative staff not included in overall staffing numbers for 2008-09 Annual Report										

## Code of Conduct

In conjunction with the Australian Public Service Commission, ARPANSA provided regular training and information sessions to staff on the APS Values and Code of Conduct. ARPANSA conducted biennial surveys of its staff aimed at ensuring that the courses were effective at imparting information on the Values and Code and ensuring that they are being applied effectively.

The Agency's human resources service delivery was assessed by ongoing evaluation of its service elements. This included consideration of the quality and effectiveness of human resources and the ongoing strengthening of industrial relations practices and procedures including workplace consultation and dispute resolution.

## Productivity Gains

### ARPANSA Performance Development System

A significant feature of ARPANSA's people management framework is the ARPANSA Performance Development System (APDS) which directly linked the annual assessment of individual staff performance during the year with pay point advancement, the branch plans and ultimately ARPANSA's strategic directions.

The APDS provided a structured approach for staff and their managers to discuss, record and measure expectations. As part of the APDS, each employee completed individual development plans with their manager, identifying their training and development needs and considering any issues occurring in the work place.

## Remuneration, Statistics and Staffing Profile

All ARPANSA staff were employed under the *Public Service Act 1999*. The CEO is a full-time holder of a Public Office, whose salary and allowances were determined by the Remuneration Tribunal.

Statistics on staffing are set out in Tables 14 to 18.

### Workplace Agreements in ARPANSA

During 2008-09, ARPANSA provided terms and conditions of employment for its employees under its collective agreement or through common law contracts (CLCs) or pre-existing Australian Workplace Agreements (AWAs) made with individual employees.

The *ARPANSA Agreement 2007–2010* which has a nominal expiry date of 30 June 2010 covers all employees of ARPANSA employed under the Public Service Act below the Senior Executive Service (SES) level and certain staff who are parties to a CLC or pre-existing Australian Workplace Agreement. The salary ranges for ARPANSA's classification levels are set out in Table 19.

As at 30 June 2009, ARPANSA had three approved CLCs for SES employees and a further 35 for non-SES personnel who are covered by a mix of CLCs and AWAs. The salary range available for employees on CLCs or AWAs is from \$50 140 to \$152 983. SES employees and a number of senior non-SES employees on CLCs or AWAs have access to performance pay. SES employees and Branch Director equivalents also have access to a range of other non-salary benefits including a privately plated vehicle.

**Table 14: Staff by location, gender and classification**

Classification	SES		EL 2		EL 1		APS 6		APS 5		APS 4		APS 3		APS 2		APS 1		Graduate		TOTAL	
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
NEW SOUTH WALES																						
Female	2	2	1	1	5	4	3	4	-	1	1	1	2	2	3	3	-	-	-	-	17	18
Male	-	-	5	6	9	10	5	4	-	-	-	-	-	-	-	-	-	-	-	-	19	20
Total	2	2	6	7	14	14	8	8	-	1	1	1	2	2	3	3	-	-	-	-	36	38
VICTORIA																						
Female	-	-	-	1	5	4	10	10	4	5	2	5	11	9	8	7	-	-	-	2	40	43
Male	1	1	12	15	15	18	14	16	9	7	1	1	3	3	-	-	-	-	3	4	58	65
Total	1	1	12	16	20	22	24	26	13	12	3	6	14	12	8	7	-	-	3	6	98	108
TOTAL																						
Female	2	2	1	2	10	8	13	14	4	6	3	6	13	11	11	10	-	-	-	2	57	61
Male	1	1	17	21	24*	28	19	20	9	7	1	1	3	3	-	-	-	-	3	4	77	85
TOTAL	3	3	18	23	34	36	32	34	13	13	4	7	16	14	11	10	-	-	3	6	134	146

\*This figure was reported as 20 in the 2007-08 Annual Report

**Table 15: Staff by gender and classification**

Classification	Female		Male		TOTAL	
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
Graduate	-	2	3	4	3	6
APS Level 1	-	-	-	-	-	-
APS Level 2	11	10	-	-	11	10
APS Level 3	13	11	3	3	16	14
APS Level 4	3	6	1	1	4	7
APS Level 5	4	6	9	7	13	13
APS Level 6	13	14	19	20	32	34
Executive Level 1	10	8	24	28	34	36
Executive Level 2	1	2	17	21	18	23
SES Band 1	2	2	1	1	3	3
<b>TOTAL</b>	<b>57</b>	<b>61</b>	<b>77</b>	<b>85</b>	<b>134</b>	<b>146</b>

## Collective Agreement

The Agency's fifth collective agreement (*ARPANSA Agreement 2007-2010*) continued to operate throughout the financial year after being lodged with the Workplace Authority on 10 April 2008. It is a comprehensive collective agreement made with union parties under section 328 of the *Workplace Relations Act 1996*.

The agreement continues to support a high performing culture and provides a positive contribution to ARPANSA's standing as the leading organisation in Australia for scientific excellence in radiation protection and nuclear safety. The agreement assists staff in balancing their work and personal life and includes a competitive remuneration framework of pay and conditions. Under the agreement, staff received a 6% pay increase effective from December 2007, with further increases of 4% payable in April 2008 and April 2009.

## Australian Workplace Agreements and Common Law Contracts

As noted in the 2007-08 reporting year, new arrangements for making workplace agreements in the APS were introduced by the Government with effect from February 2008. A key feature of these revised arrangements was that Australian Workplace Agreements (AWAs) were no longer able to be offered or varied by APS Agencies, while existing AWAs were to continue in operation until terminated or replaced. The majority of AWAs in ARPANSA have a nominal expiry date of 30 June 2010.

During 2008-09, all ongoing senior executive service (SES) employees and Branch Directors below the SES level had remuneration arrangements agreed through individual common law contracts (CLCs) or AWAs. During the reporting period, CLCs were also offered to a number of other employees on a case-by-case basis.

**Table 16: Full-time equivalent (FTE) staff by gender and classification**

Classification	Female		Male		TOTAL	
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
Graduate	-	2	3	4	3	6
APS Level 1	-	-	-	-	-	-
APS Level 2	9.34	8.34	-	-	9.34	8.34
APS Level 3	12.69	10.69	3	3	15.69	13.69
APS Level 4	3	6	1	1	4	7
APS Level 5	4	6	8.8	7	12.8	13
APS Level 6	12.6	13.6	17.88	19.2	30.48	32.8
Executive Level 1	10	8	24	28	34	36
Executive Level 2	1	1.4	17	21	18	22.4
SES Band 1	2	2	1	1	3	3
<b>TOTAL</b>	<b>54.63</b>	<b>58.03</b>	<b>75.68</b>	<b>84.2</b>	<b>130.31</b>	<b>142.23</b>

Remuneration for employees on CLCs and AWAs is based on ensuring that employees are rewarded according to the specialist skills and knowledge they bring to the Agency and how much they assist the Agency to meet its corporate goals. CLCs and AWAs are structured to ensure that the remuneration arrangements are flexible and in so doing, assist in recruitment and retention of these specialist staff.

### Non-Salary Benefits

- Flexible working arrangements, including flextime, job-sharing, part-time and home based work.
- Provision for leave, including annual leave, long service leave (both of which can be taken on half-pay), personal leave, bereavement leave, maternity leave, paternity/non-primary care giver leave,

parental leave, employee funded extra leave, study leave, ceremonial leave, war-service sick leave, defence service leave, compensation/accident leave, jury service leave and a range of miscellaneous leave entitlements (with and without pay).

- Study assistance.
- Employee assistance program.
- Flexible remuneration packaging scheme.
- Provision for business related equipment.
- Airline club membership when travelling overseas.

### Performance Pay

The remuneration and allowances of Senior Executive Service officers of ARPANSA are covered by Common Law Contracts in force as at 30 June 2009.

**Table 17: Staff employed under the PS Act as at 30 June 2008 and 2009**

	Full-time Ongoing		Full-time Non-Ongoing		Part-time Ongoing		Part-time Non-Ongoing		TOTAL	
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
Female	51	54	-	-	6	6	-	1	57	61
Male	72	79	2	4	2	2	1	-	77	85
<b>TOTAL</b>	<b>123</b>	<b>133</b>	<b>2</b>	<b>4</b>	<b>8</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>134</b>	<b>146</b>

**Table 18: Distribution of staff by Branch**

Branch	Female				Male				TOTAL	
	Ongoing		Non-Ongoing		Ongoing		Non-Ongoing		TOTAL	
	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009	June 2008	June 2009
Office of the CEO (including Legal Support)	3	5	-	-	3	4	-	-	6	9
Environmental and Radiation Health	8	8	-	-	16	15	2	2	26	25
Medical Radiation	11	12	-	-	10	14	1	1	22	27
Non-Ionizing Radiation	4	2	-	-	14	16	-	-	18	18
Regulatory and Policy	13	14	-	-	20	22	-	1	33	37
Corporate Services	18	19	-	1	11	10	-	-	29	30
<b>TOTAL</b>	<b>57</b>	<b>60</b>	<b>-</b>	<b>1</b>	<b>74</b>	<b>81</b>	<b>3</b>	<b>4</b>	<b>134</b>	<b>146</b>

The remuneration of ARPANSA's SES is reported in the Financial Statements at Appendix 10.

The number of APS employees at each classification level who received performance pay:

- SES Band 1: 3
- Non-SES: 6

The aggregated amount of performance pay for the Agency as a whole year was \$97 586.

The average bonus payment was \$9758.

## Commonwealth Disability Strategy

The *Commonwealth Disability Strategy* was taken into account in ARPANSA's forward-planning and corporate planning processes.

**Table 19: Salary ranges as at 30 June 2009**

<b>APS Classification</b>	<b>Salary Range (\$)</b>
ARPANSA Graduate	52 006 – 67 733
APS Level 1	39 012 – 44 344
APS Level 2	45 674 – 50 140
APS Level 3	52 006 – 58 191
APS Level 4	59 938 – 62 632
APS Level 5	64 511 – 67 733
APS Level 6	69 764 – 79 799
Executive Level 1	86 186 – 99 165
Executive Level 2	105 315 – 119 593

## Assets Management

ARPANSA managed non-financial assets totalling \$19.2 million. The major categories are land and buildings and infrastructure plant and equipment. ARPANSA's capital investment plan was reviewed to ensure on-going building maintenance and renovation; equipment purchases and IT infrastructure upgrades met future research and operational requirements.

## Purchasing

ARPANSA's purchasing policies are outlined in the Chief Executive's Instructions and associated procedural rules, and reflect the principles of the Commonwealth Procurement Guidelines – December 2008 (CPGs). Procurement activities for the year, complied with the policies and principles outlined in the CPGs.

An Annual Procurement Plan for 2008-09 was prepared and published on the AusTender in June.

## Consultants

During 2008-09, eight new consultancy contracts were entered into involving total actual expenditure of \$930 947. In addition, five ongoing consultancy contracts were active during the 2008-09 year, involving total actual expenditure of \$115 410.

The Agency policy on selection and engaging consultants is in accordance with the Commonwealth Procurement Guidelines, based on the core principle of value for money and underpinned by:

- encouraging competition by ensuring non-discrimination in procurement and using competitive procurement processes
- promoting the use of resources in an efficient, effective and ethical manner
- making decisions in an accountable and transparent manner.

These requirements are further emphasised in the Chief Executive's Instructions and supporting practical guides.

ARPANSA engaged consultants where there was a requirement for specialist expertise that was not available within the Agency, or where an independent assessment was required. The selection process included

selection from a panel or direct engagement of a recognised or pre-eminent expert.

Information on expenditure on contracts and consultancies is also available on the AusTender website [www.tenders.gov.au](http://www.tenders.gov.au)

**Table 20: Consultancy services let during 2008-09, of \$10 000 or more**

Consultant Name	Nature/purpose of consultancy	Contract Price (Includes GST)	Selection process <sup>1</sup>	Justification <sup>2</sup>
Step Two Design	Intranet redesign	\$78 158	Direct Sourcing	B
Stratsec.Net Pty Ltd	ICT Risk Assessment	\$31 680	Direct Sourcing	C
AON Risk services	Development of Risk Management Plan	\$53 326	Direct Sourcing	C
HBA Consulting	Investigation	\$13 200	Direct Sourcing	C
Joyner and Associates	Preparation of specialist documentation for NATA accreditation	\$27 500	Direct Sourcing	B
Lambert & Rehbein (Vic) Pty Ltd	Provision of specialist services in relation to building redesign	\$688 336	Open Tender	B
Human Solutions Pty Ltd	Database development	\$387 475	Open Tender	B
SecureLink Pty Ltd	ICT Risk Assessment	\$35 640	Direct Sourcing	C
<b>TOTAL</b>		<b>\$1 315 315</b>		

Note 1: The following explanation of selection process terms is drawn from the Commonwealth Procurement Guidelines – December 2008:

*Open Tender:* A procurement procedure in which a request for tender is published inviting all businesses that satisfy the conditions for participation to submit tenders.

*Select tender:* A procurement procedure in which the procuring agency selects which potential suppliers are invited to submit tenders in accordance with the mandatory procurement procedures.

*Direct Sourcing:* A procurement process, available only under certain defined circumstances, in which an agency may contact a single potential supplier or suppliers of its choice and for which conditions for direct sourcing apply under the mandatory procurement procedures.

*Panel:* An arrangement under which a number of suppliers, usually selected through a single procurement process, may each supply property or services to an agency as specified in the panel arrangement.

Note 2: Justification for decision to use consultancy:

A – skills currently unavailable within agency

B – need for specialised or professional skills

C – need for independent research or assessment



## ***Appendices***



## Appendix 1: Occupational Health and Safety

### OH&S Management

The Committee chaired by a Branch Director and made up of Health and Safety Representatives, deputy Health and Safety Representatives and management representatives of all Branches met on alternate months in accordance with its schedule.

OH&S measures undertaken through the Committee included:

- training for Committee members on Committee responsibilities
- OH&S training for managers and supervisors
- appointment of a Senior First Aid Officer and replenishment of all First Aid supplies
- oversight of OH&S measures to be implemented during the building renovation of the Yallambie campus.

The Radiation Safety Committee chaired by one of ARPANSA's licence holders met regularly and reported to the OH&S Committee. The Committee developed a comprehensive radiation safety management system to support the recently updated *ARPANSA Radiation Safety Manual*.

### OH&S Inspections

Representatives of the OHS Committee conducted OH&S inspections of all work areas within ARPANSA during the year. The inspections resulted in a number of

corrective action requests being issued which were attended to by the relevant branch management.

### Health and Safety Representatives

In accordance with amendments to the *Occupational Health and Safety (Commonwealth Employees) Act 1991* (OHS (CE) Act) coming into effect in March 2006, the OH&S Agreement negotiated with the unions was replaced by Health and Safety Management Arrangements.

ARPANSA operated two Designated Work Groups at the Yallambie campus and one at the Miranda campus each with a Health and Safety Representative and a Deputy. During the year, elections were held for all positions with successful candidates appointed for a period of two years. Four representatives were re-elected and two new representatives received Comcare accredited training.

### Incidents or Injuries

No incidents or injuries occurred during the year requiring Comcare notification under section 68 of the OHS (CE) Act were reported.

### Investigations or Notices Given

No investigations were conducted or notices given relevant to sections 29, 45 and 46 of the OHS (CE) Act.

## Appendix 2: Ecologically Sustainable Development and Environmental Performance

The object of the ARPANS Act is to protect the health and safety of people and to protect the environment, from the harmful effects of radiation. In accordance with the Act, ARPANSA takes into account the radiological impact on the environment in assessing licence applications from Commonwealth entities and their contractors.

The Agency supports and promotes practices that can improve energy management and environmental practices within both the Sydney and Melbourne offices. ARPANSA has in place an Environment Policy and is committed to:

- complying with relevant Commonwealth and state environment legislation and with the Australian Government's environmental policies and initiatives
- implementing a continually improving standard of environmental performance and provide an environmentally sound workplace
- striving to develop an environmentally responsible culture across the agency by providing appropriate resources and training to build awareness and support initiatives
- integrating environmental, social and economic considerations in its decision making including decisions on purchasing, in contracting for goods and services and in any building work it undertakes
- encourages openness, transparency and improved accountability by reporting its environmental management annual reports and engaging with the community

- implementing and maintaining an Environmental Management System aligned with the ISO 14001 Standard.

During 2008-09, water saving measures at the Yallambie premises saw a significant reduction in water use from 3034 KL in 2007-08 to 1098 KL in 2008-09 (Figure 5).

ARPANSA has committed to undertaking a major building renovation project for the Melbourne facility commencing in early 2010. The project established a Renovation Advisory Committee (RAC) to provide stakeholder input to the project. The Environmental Management Committee's responsibilities have been temporarily transferred to the RAC to ensure that the renovation delivers a facility that is fit for purpose and environmentally compliant. At the completion of the renovation works the Environmental Management Committee will be reinstated.

An environmental management plan has been developed as part of the building renovation project plan. The environmental management plan covers monitoring and impact of the building works in accordance with ISO 14001. The RAC has identified a number of environmental efficiencies that will be included as part of the renovation and will comply with the Government's *Energy Efficiency in Government Operations (EEGO) Policy*. The efficiencies identified included:

- the installation of dimmable fluorescent lighting which will sense natural light levels and adjust the lights accordingly

- conversion of the building to a mainly open plan environment which will aid in balancing the heating and cooling system and reduce energy usage
- specific use of environmentally friendly products such as bamboo timber flooring and 5 star rated environmentally friendly vinyl products
- use of modern, efficient insulation reducing the significant effect of temperature variations on the building
- conversion of two 20 000 litre waste water tanks for the purpose of water harvesting to feed this water back into the system for flushing toilets.

These environmental upgrades coupled with sound policies and procedures should allow the Agency to achieve a five star rating in accordance with the *Australian Building Greenhouse Rating* (recently renamed NABERS Energy).

Figure 5: Water consumption Yallambie 2005 to 2009



## Appendix 3: Freedom of Information

In compliance with section 8 of the *Freedom of Information Act 1982* (FOI Act), the information below is the annual statement by ARPANSA in relation to its consultative arrangements, categories of documents maintained and procedures for access to documents covered by the FOI Act.

### Organisation

ARPANSA is an Agency that is established under the *Australian Radiation Protection and Nuclear Safety Act, 1998* (ARPANS Act). The office of the CEO of ARPANSA is created under that Act.

The CEO of ARPANSA is tasked with protecting the health and safety of people and the environment from the harmful effects of radiation (ionizing and non-ionizing). Specifically, ARPANSA is responsible for:

- regulating all Commonwealth entities, including Departments, Agencies and Bodies Corporate and Commonwealth Contractors<sup>1</sup>, either dealing with radioactive material or apparatus or undertaking conduct in relation to nuclear installations or prescribed radiation facilities
- providing advice to government and the community on radiation protection and nuclear safety
- undertaking research and providing services in relation to radiation protection, nuclear safety and medical exposures to radiation

- promoting uniformity of radiation protection and nuclear safety policy and practices across jurisdictions of the Commonwealth, the states and the territories.

### Arrangements for Participation

#### Public Submissions

The licensing of nuclear facilities requires the CEO of ARPANSA to invite public submissions on a licence application. The Agency has established a public submission process in relation to such facilities. These include public meetings.

#### Other Community Consultation

ARPANSA publishes quarterly and annual reports and technical reports that are available to the general public through libraries, electronically or on request. The Agency's Council and Committees also engage in public consultation in relation to matters under its consideration.

ARPANSA officers are available to address inquiries from members of the public regarding any of ARPANSA's activities. Information brochures on particular topics are available on request, free of charge or on the ARPANSA internet website.

#### State and Territory Government Arrangements

All states and territories are represented on ARPANSA's Radiation Health Committee. In addition, ARPANSA supports and contributes to regular meetings of other radiation regulatory authorities. Reports

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<sup>1</sup> As defined under section 13 of the ARPANS Act.

prepared by ARPANSA are regularly forwarded to state and territory regulatory authorities for review and comment. As members of the Visiting Ships Panel (Nuclear), ARPANSA officers regularly liaise with state government departments responsible for the safe visits of nuclear powered warships to Australian ports.

## **Australian Government Arrangements**

ARPANSA communicates with other Australian Government departments and agencies as required.

## **Categories of Documents Held**

### *Available on request*

- ARPANSA's quarterly and annual reports to Parliament
- technical fact sheets
- information about ARPANSA's activities.

### *Documents relating to the decision making process*

- decisions and directions of the CEO
- memoranda recommending decisions
- deeds
- legal contracts and formal arrangements, such as Memorandum of Understanding
- minutes and submissions
- applications
- documents used by ARPANSA to assess applications
- public submissions.

### *General correspondence*

- Ministerial briefs
- speeches
- conference papers
- Parliamentary questions and answers

- facsimiles, electronic messages
- general records files.

### *Technical documents*

- scientific and technical reports
- computer disks and print outs
- plant and equipment operating manuals
- records of audits inspections and reviews
- maintenance, quality assurance and safety manuals
- accounting records
- photographs.

### *Health and safety related documents*

- accident reports as applicable
- emergency response procedures.

### *Administration documents*

- organisation and establishment reports
- contract documents
- building plans
- instructions, directives and orders
- memoranda
- bulletins and notices.

## **Procedure and Initial Contact for Inquiries**

The initial contact for inquiries in relation to freedom of information is the Freedom of Information Coordinator who is located in Miranda.

Requests for access to information under the FOI Act must be made in writing and addressed to 'The FOI Coordinator' and be accompanied by an application fee: currently, \$30.00.

FOI queries may be made in the first instance to the FOI Coordinator, who

may be contacted on (02) 9541 8301. The FOI Act provides for the reduction of the application fee or waiver of the fee in certain circumstances.

It should be noted that in many cases, it is not necessary to use FOI processes, as the information sought by the applicant may be readily available. If this is the case, the FOI Coordinator should be contacted in the first instance on 02 9541 8301.

All correspondence concerning FOI matters should be addressed to the FOI Co-ordinator, PO Box 650, MIRANDA NSW 1490 or by email to **info@arpansa.gov.au**.

If the person wishes to lodge a FOI request then they need to:

- make a request in writing (s 51(2)(a) of the FOI Act)
- provide such information about the document(s) as is reasonably necessary to enable the document(s) to be identified
- specify an address in Australia to which notices may be sent
- send the request by post to ARPANSA
- ensure that \$30.00 accompanies the request.

Any request for remission of fees should accompany the initial application and state the reason for the request. Reasons may include financial hardship or that the request for information is in the public interest.

In accordance with ARPANSA's procedures for processing FOI requests, the FOI Co-ordinator may, in some instances,

need to consult applicants about access to documents under the FOI Act. Consultation is required to:

- to assist the applicant to identify, more specifically, documents which he or she has requested, or
- to give to the applicant a reasonable opportunity for consultation before refusing a request on the grounds of insufficient information (s 15(2) of the FOI Act) or if the request requires a substantial and unreasonable diversion of resources (s 24(1) of the FOI Act), or
- to notify the applicant of the charges and the deposit that is payable, or to discuss a request that the charges be reduced or waived.

ARPANSA Branch Directors are authorised under s 23 of the FOI Act, to make primary decisions on applications for access to documents held in their individual areas. Access is generally provided by way of copies of documents to the applicant.

In addition, the CEO of ARPANSA is authorised to make decisions on applications for internal review of primary decisions on FOI requests made to ARPANSA.

Further guidance as to how to make an application for access to documents under Freedom of Information can be obtained from **www.law.gov.au/foi**.

Information about ARPANSA is available on the ARPANSA Internet web site (**www.arpansa.gov.au**) or from the Freedom of Information Coordinator.

## Appendix 4: Legal Services Directions

The legal services directions reflect the obligations imposed on Chief Executives by the *Financial Management and Accountability Act* and emphasise the general requirement that Commonwealth resources be used efficiently and effectively.

Chief Executives are required to take responsibility for the proper recording and public reporting of their agency's legal services expenditure. Proper recording will enhance the ability of Chief Executives to engage in decision making about legal resources that complies with their legal obligation to use resources efficiently and

effectively. Making publicly available records about expenditure will enhance transparency. In accordance with the Directions, the CEO has certified that:

- ARPANSA has appropriate systems and procedures in place to ensure compliance with the Directions; and
- ARPANSA has no record of any alleged, possible or determined breach of the Directions by this agency during the financial year.

Details of the legal services expenditure for the Agency for 2008-09 are provided in Table 21.

Table 21: Legal services expenditure by ARPANSA for 2008-2009	
Legal Service	Expenditure (incl. GST)
Agency's total legal services expenditure	\$271 539
Agency's total external legal services expenditure	\$38 235
External expenditure on solicitors	\$38 235
External expenditure on counsel	-
Other disbursements on external legal services	-
Agency's total internal legal services expenditure	\$233 304



## Appendix 5: Advertising and Market Research

ARPANSA did not commission any work from creative advertising agencies, market research organisations, polling organisations or direct mail organisations. During 2008-09 total expenditure on advertising and public notices amounted to \$166 292 (inclusive of GST).

Details of payments of \$10 900 and above (inclusive of GST), as required under section 311A of the *Commonwealth Electoral Act 1918*, are contained in Table 22.

Table 22: Details of payments of \$10 900 and above (inclusive of GST) for advertising and public notices during 2008-09		
Organisation	Purpose	Expenditure
HMA Blaze Pty Ltd	Tender and recruitment advertising	\$166 292

## Appendix 6: ARPANSA Licensing Activities

**Table 23: Details of any breach of licence conditions by a licensee during the financial year of which the CEO is aware**

Licence Holder	Licence No	Nature of Breach
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).
	F0044-5A, 5B, 5C	S30(2) of the ARPANS Act. Exceeding operational limits and conditions. S30(2) of the ARPANS Act. Non-compliance with the <i>Code of Practice for the Safe Transport of Radioactive Material 2008</i> . Exceeding the radioactive content for 'Type A' package.
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).
	S0042	S31(2) of the ARPANS Act – failure to comply with own plans and arrangements.
Australian National University	S0027	S31(2) of the ARPANS Act – failure to comply with licence conditions – breach of Regulation 53(1) for disposing of controlled apparatus without prior approval.
		S31(2) of the ARPANS Act – failure to comply with licence conditions – breach of Regulation 53(2) for transferring controlled apparatus and failing to notify ARPANSA within 7 days.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not complying with codes and standards.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not updating source inventory.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not reviewing plans and arrangements.
		S31(2) of the ARPANS Act by disposing of 2 items of non-ionizing radiation controlled apparatus without prior approval.
Australian War Memorial	S0080	S31(2) of the ARPANS Act – failure to comply with licence conditions by not providing updated source inventory.
CSIRO – Sustainable Ecosystems	S0018	S31(2) of the ARPANS Act – failure to comply with licence conditions (late submission of quarterly report).
CSIRO – Corporate Property	S0013	S31(2) of the ARPANS Act – for not providing an environmental audit in the required timescale.

**Table 23: Details of any breach of licence conditions by a licensee during the financial year of which the CEO is aware (continued)**

Licence Holder	Licence No	Nature of Breach
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).
		S31(2) of the ARPANS Act – failure to comply with licence conditions (Class 4 laser not fitted with an appropriate radiation warning sign) .
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not submitting the Jan – Mar 2008 quarterly report within the specified time.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not submitting the Jul – Sept 2008 quarterly report within the specified time.
		S31(2) of the ARPANS Act by disposing of 5 items of non-ionizing radiation controlled apparatus without prior approval.
CSIRO – Land and Water	S0009	S31(2) of the ARPANS Act – failure to request approval under Regulation 51 to deal with a sealed source in a mobile gauge.
CSIRO – Livestock Industries	S0022	S31(2) of the ARPANS Act – failure to comply with licence conditions by not ensuring that people dealing with controlled apparatus are appropriately trained.
		S31(2) of the ARPANS Act – failure to meet the requirements of Regulation 46 which requires that all reasonable steps are undertaken to prevent accidents, accidents are reported within 24 hours, and a written report is provided within 14 days.
		S31(2) of the ARPANS Act – failure to meet Regulation 59 which requires a licensee to follow its own plans and arrangements.
CSIRO – Manufacturing and Materials Technology	S0066	S31(2) of the ARPANS Act – failure to comply with licence conditions by not complying with relevant codes and standards.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not following own written work procedures as per Regulation 49.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not reporting relevant changes to laser training as per Regulation 52.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not submitting the Jan – Mar 2008 quarterly report within the specified time.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not submitting the Jul – Sept 2008 quarterly report within the specified time.

**Table 23: Details of any breach of licence conditions by a licensee during the financial year of which the CEO is aware (continued)**

Licence Holder	Licence No	Nature of Breach
CSIRO – Minerals	S0064	S31(2) of the ARPANS Act – failure to comply with licence conditions by not making a request for prior approval to deal with additional items under Regulation 51.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by not complying with the relevant codes and standards .
CSIRO – Molecular and Health Technologies	S0016	S31(2) of the ARPANS Act – failure to comply with licence conditions (inventory of sources not maintained).
		S31(2) of the ARPANS Act – failure to comply with licence conditions (non-ionizing apparatus not fitted with appropriate warning labels).
Department of Agriculture Fisheries and Forestry – Australian Quarantine Inspection Service	S0120	S31(2) of the ARPANS Act by – failure to comply with licence conditions by disposing of controlled apparatus without prior approval as per Regulation 53(1).
Department of Foreign Affairs and Trade	S0079	S31(2) of the ARPANS Act – failure to comply with licence conditions by not providing training to users of non-ionizing apparatus.
		S31(2) of the ARPANS Act – failure to comply with licence conditions by the lack of work procedures for non-ionizing apparatus.
		S31(2) of the ARPANS Act – failure to comply with licence conditions – disposal of controlled apparatus without prior approval – Regulation 53.
Federal Court of Australia	S0036	S31(2) of the ARPANS Act for late submission of April – June 2008 quarterly report.
Law Courts Limited	S0165	S31(2) of the ARPANS Act – failure to comply with licence conditions by not submitting the Jul – Sept 2008 quarterly report within the specified time.
National Measurement Institute	S0142	S31(2) of the ARPANS Act – failure to take all reasonably practicable steps to prevent accidents from occurring as per Regulation 46(1).
		S31(2) of the ARPANS Act – failure to comply with their own plans and arrangements as per Regulation 49.
		S31(2) of the ARPANS Act – for unapproved disposal of controlled apparatus as per Regulation 53(1).
		S31(2) of the ARPANS Act – for disposing of 3 controlled non-ionizing radiation apparatus without prior approval.

**Table 24: Source licences as at 30 June 2009**

<b>Commonwealth entity</b>	<b>Licences held</b>
ASC Pty Ltd	1
Attorney General's Department	1
Attorney General's Department D Branch	1
Australian Crime Commission	1
Australian Customs Service	1
Australian Defence Force /Department of Defence	1
Australian Federal Police	1
Australian Institute of Marine Science	1
Australian National University	1
Australian Nuclear Science and Technology Organisation (ANSTO)	3
Australian Postal Corporation	1
Australian Quarantine and Inspection Service (AQIS)	1
Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)	3
Australian Securities and Investments Commission	1
Australian Trade Commission	1
Australian War Memorial	1
Bureau of Meteorology – Cape Grim	1
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	16
Decipha Pty Ltd	1
Department of Foreign Affairs and Trade	1
Department of Immigration and Citizenship	1
Department of Innovation, Industry, Science and Research – National Measurement Institute	1
Department of Parliamentary Services	1
Department of Prime Minister and Cabinet	1
Department of Resources Energy and Tourism – Geoscience Australia	1
Department of Resources Energy and Tourism – Geoscience Australia – Geospatial & Earth Monitoring Division	1
Department of the Environment, Water, Heritage and the Arts – Australian Antarctic Division, Polar Medicine	1
Department of the Environment, Water, Heritage and the Arts – Australian Antarctic Division	1
Department of the Environment, Water, Heritage and the Arts – Supervising Scientist	1

**Table 24: Source licences as at 30 June 2009 (continued)**

<b>Commonwealth entity</b>	<b>Licences held</b>
Family Court of Australia	1
Federal Court of Australia	1
High Court of Australia	1
Law Courts Limited	1
National Gallery of Australia	1
National Museum of Australia	1
Note Printing Australia	1
Royal Australian Mint	1
Silex Systems Ltd	1
<b>Total</b>	<b>57</b>

**Table 25: Facility licences as at 30 June 2009**

<b>Commonwealth entity</b>	<b>Licences held</b>
Australian Customs Service	5
Australian National University	3
Australian Nuclear Science and Technology Organisation (ANSTO)	18
Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)	1
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	1
Department of Defence	5
Department of Environment, Heritage and the Arts – Parks Australia North	1
Department of Resources and Energy – Maralinga	1
<b>Total</b>	<b>35</b>

## Exemptions from the Requirements for Licensing

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.

The CEO of ARPANSA has declared in writing that the use of Ni-63 in gas chromatographs by the Department of Foreign Affairs and Trade (S0079) up to an activity of 750 MBq is exempt subject to conditions on disposal of the devices, and has been published in the *Gazette*.

## Transport of Radioactive Materials

The CEO of ARPANSA, as the competent authority under the *Code of Practice for the Safe Transport of Radioactive Material* (ARPANSA 2008) for transport of radioactive material by road and rail issued two validation certificates: for Type B containers and two validation certificates for special form radioactive materials.

The CEO of ARPANSA also issued a shipment certificate for shipment of ANSTO Fuel from ANSTO to a dedicated port in the Sydney area.

## Appendix 7: Operations of the Radiation Health and Safety Advisory Council

### Introduction

Council's 2005-08 triennium ended on 30 September 2008, and a new Council, as listed below, was appointed by the Minister for the 2009-11 triennium.

*Chair:*

Ms Sylvia Kidziak AM

*CEO:*

Mr Peter Burns (acting)

*Person to represent the interests of the general public:*

Em. Professor Ian Lowe

*Radiation Control Officers:*

Mr Keith Baldry (SA)

Mr Simon Critchley (QLD)

*Nominee of the Chief Minister of NT:*

Mr Ian Lancaster

*Up to 7 other Members:*

Ms Margaret Conley

Ms Jill Fitch

Dr Peter Glazebrook

Prof John Kaldor (from 15 May 2009)

Assoc. Professor Graeme Morgan

Dr Denise Wheeler

There is one vacancy remaining on Council.

Council met on three occasions, August 2008 (Yallambie), February 2009 (Miranda) and June 2009 (Yallambie) and considered a wide range of radiation protection and nuclear safety topics.

### Council Advice to CEO of ARPANSA

#### National Directory for Radiation Protection (NDRP) Review

In reviewing the effectiveness and efficiency of the NDRP as requested by the Radiation Health Committee and the CEO, Council discussed the final report of the consultant, who had analysed the data on implementation of NDRP, at the August 2008 meeting. Council concluded that the NDRP is an effective and pragmatic document that has provided a catalyst for changes to improve uniformity, and that much progress has been made by jurisdictions. Council also recognised that more efficient regulatory processes for improving uniformity could be developed in the future. Council's advice to the CEO concluded that the intention of the NDRP is not to have uniform legislation, but to have uniform outcomes. The codes supporting the NDRP are also an important part of the uniformity process. Council regards the NDRP as a valuable document used by jurisdictions to guide their regulatory approach. The NDRP also gives weight to approaches to government requesting regulatory change.

Council identified the time frame to produce NDRP changes as a major concern. Council also noted that regulatory impact assessment requirements have changed since publication of the NDRP, and that this had contributed to extending the timelines in producing amendments to NDRP. Council



was informed of action agreed by Radiation Health Committee to overcome this difficulty, that is, that the NDRP process will now provide for items to be progressed as individual amendments rather than compiled into a consolidated edition, thereby allowing straightforward items to progress quickly and not be held up by those requiring more complex regulatory impact assessment. Council supported these process changes in the future development of NDRP.

### **Intermediate Level Waste Progress Report**

Council continued the work on Intermediate Level Waste, undertaken at the request of the CEO. At its August 2008 meeting, which was also attended by an ANSTO representative, Council examined a range of recent international guidance documents and drafts, including classification of waste, requirements for disposal of radioactive waste, borehole disposal and pre-disposal management. Council also discussed a review of waste management approaches in overseas countries including Austria, Canada, Finland, France, Netherlands, Norway, Sweden, United Kingdom, and USA. The Support Action: Pilot Initiative for European Regional Repositories was also considered.

Australian information reviewed included Australia's long-lived intermediate level waste (LLILW) inventory, the nuclear waste conditions from the Department of Environment and Heritage's *Environment Assessment Report – Proposed Replacement Nuclear Research Reactor at Lucas Heights* (Feb 1999) and the work of the Radiation Health Committee to prepare an Australian document on classification of waste. Council concluded that there was a need for regulatory guidance on management and

disposal of LLILW, and reported to the CEO at the end of its triennium in September 2008 on its progress on this issue, including advising on possible further work for the incoming Council.

### **2009 Project on Intermediate Level Waste**

Following the outgoing Council's advice of September 2008, the CEO responded at the February 2009 meeting, and requested that Council undertake further work on intermediate level waste, and in particular carry out a scoping review of the types of intermediate level waste in Australia and the types of regulatory guidance required. Council also noted the need to characterise waste, to consider the suitability and sustainability of long term storage, and the outcomes of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management review meeting in May 2009. Council agreed a workplan at the June 2009 meeting, and had presentations on classification of radioactive waste, Australia's inventory of intermediate level radioactive waste, and radium legacy waste. A working group was formed to develop a draft report that would be considered further by Council at the November 2009 meeting, when other government bodies would be invited to make presentations and participate. Council would then finalise its report following the first meeting in 2010.

### **Adoption of Codes of Practice and Standards**

During the year, Council advised the CEO to adopt the following codes and standards developed by the Radiation Health Committee:

- RPS2.1 *Safety Guide for the Safe Transport of Radioactive Material* (2008)

- RPS14.1 *Safety Guide for Radiation Protection Diagnostic and Interventional Radiology* (2008)
- RPS14.2 *Safety Guide for Radiation Protection in Nuclear Medicine* (2008)
- RPS14.3 *Safety Guide for Radiation Protection in Radiotherapy* (2008)
- RPS15 *Safety Guide for Management of Naturally Occurring Radioactive Material* (2008)
- RPS 16 *Safety Guide for Predisposal Management of Radioactive Waste* (2008)
- RPS17 *Code of Practice and Safety Guide for Radiation Protection in Veterinary Medicine* (2009)
- RPS18 *Safety Guide for Use of Radiation in Schools – Part 1: Ionizing Radiation* (2009).

## Other Issues Considered

Council noted a report on the regulation of laser pointers across Australia. Regulation has been introduced in most jurisdictions via criminal acts and codes to control the misuse of such lasers.

Council noted that the UK Health Protection Agency had released a press statement and information booklet dealing with pregnant patients and exposure to diagnostic ionizing radiation. Council was informed that the approach in Australian codes and safety guides was similar, but noted that there was only limited information available for patients. Council wrote to the CEO seeking his view on how this matter can best be addressed and who should be responsible to produce such material.

Council discussed ARPANSA's role in various international and regional forums, and in particular discussed the outcomes of the 3<sup>rd</sup> Review Meeting of the Joint Convention on the Safe Management of Spent Fuel and the Safe Management of Radioactive Waste, held in May 2009.

Council also had the opportunity to hear an address by Dr Ziggy Switkowski on 'Climate change and the role of nuclear power'.

Council discussed some recent Australian and overseas radiotherapy accidents, and ARPANSA's ongoing role in the radiotherapy community.

In keeping with Council's intention to foster closer relations with State and Territory regulatory agencies, Council discussed an overview and outline of current radiation protection issues in Victoria with officers of the Department of Human Services.

At the June 2009 meeting, Council received briefings followed by tours of the new ARPANSA linac and the UV laboratories. Council also travelled to the Australian Synchrotron, where it received briefings from synchrotron staff and Victorian Department of Human Services radiation regulatory staff, followed by a tour of the synchrotron and beam lines.

At each meeting, Council also received and discussed reports from the CEO on ARPANSA activities along with reports from the Nuclear Safety Committee and Radiation Health Committee. ARPANSA staff also attended meetings for particular items to brief Council and discuss key issues.

## Appendix 8: Operations of the Radiation Health Committee and the Nuclear Safety Committee

### Operations of the Radiation Health Committee

The Radiation Health Committee's 2006-08 triennium ended on 31 December 2008.

Mr Simon Critchley completed his term as Chair of the Committee. Mr Jim Hondros, representing the Nuclear Safety Committee, finished his tenure on the Committee. Mr Robin Chapple, representing the interests of the general public, and Mr Kym Trask, the radiation control officer representing the ACT, resigned from the Committee during the final year of the triennium. The members of the Committee, who have been appointed for 2009-11 triennium, are:

*Chair:*

Mr Keith Baldry (SA)

*CEO of ARPANSA (Acting):*

Mr Peter Burns

*Radiation Control Officers (each State & Territory):*

Mr Len Potapof (NSW)

Dr Brad Cassels (VIC)

Ms Hazel Upton (WA)

Mr Simon Critchley (QLD)

Dr Barbara Shields (TAS)

Mr Russell Robinson (NT)

Mr Brian Jones (ACT)

*Nuclear Safety Committee representative:*

Mr Don Macnab

*Person to represent the interests of the general public:*

Dr Peter Karamoskos

*Other members:*

Dr Roslyn Drummond

Prof Andrew Wood

The Committee met at ARPANSA's Yallambie office on three occasions, 16-17 July 2008, 19-20 November 2009 and 18-19 March 2009. Meeting summaries were posted on the ARPANSA web site. Mr Jim Turnbull, Group Manager, National Radiation Laboratory, New Zealand, or his delegate, attended meetings as an observer by invitation.

During 2008-09, the Committee discussed a draft strategy for the 2009-11 triennium. The Committee agreed that the revision of RPS 1 *Recommendations for Limiting Exposure to Ionizing Radiation (1995) and National Standard for Limiting Occupational Exposure to Ionizing Radiation* (ARPANSA republished 2002) was the top priority and that a consultant should be employed to accelerate its progress. The Committee suggested that the RHC should strive to achieve nationally uniform outcomes, not just codes and standards. The Committee decided that the priority outcome areas to be included in the RHC Strategy were the medical applications of ionizing radiation, a review of the *Code of practice for the safe use of industrial radiography equipment* (NHMRC 1989), environmental protection (non-human biota) from naturally occurring radioactive material, including uranium mining, and areas of public concern, such as non-ionizing radiation and radioactive waste. The RHC Strategy will be finalised at the July 2009 meeting.

Draft NDRP amendment No. 4 on the regulation of solarium was approved by the Committee to be released for public consultation. The amendment was subsequently released, together with a

consultation Regulatory Impact Statement (RIS), from 17 October to 14 November 2008. The Committee approved a draft NDRP amendment containing provisions for X-ray analysis equipment to be released for public consultation, subject to the RIS requirements being completed. This is expected to occur in the next reporting year.

During the year, the Committee approved the following draft documents for publication in the Radiation Protection Series and recommended that the CEO forward the drafts to the Radiation Health and Safety Advisory Council for its recommendation on adoption:

- RPS2.1 *Safety Guide for the Safe Transport of Radioactive Material* (2008)
- RPS14.1 *Safety Guide for Radiation Protection Diagnostic and Interventional Radiology* (2008)
- RPS14.2 *Safety Guide for Radiation Protection in Nuclear Medicine* (2008)
- RPS14.3 *Safety Guide for Radiation Protection in Radiotherapy* (2008)
- RPS15 *Safety Guide for Management of Naturally Occurring Radioactive Material* (2008)
- RPS 16 *Safety Guide for Predisposal Management of Radioactive Waste* (2008)
- RPS17 *Code of Practice and Safety Guide for Radiation Protection in Veterinary Medicine* (2009)
- RPS18 *Safety Guide for Use of Radiation in Schools – Part 1: Ionizing Radiation* (2009).

The Committee decided that the safety guides for diagnostic and interventional radiology, nuclear medicine and radiotherapy should be reviewed within two years. The Committee

considered a proposal for developing additional annexes for the *Safety Guide for the Management of Naturally Occurring Radioactive Material (NORM)* (ARPANSA 2008) and concluded that the coal/electricity and the metal extraction industries should be the next annexes prepared.

The draft *Safety Guide for the Use of Radiation in Schools – Part 1: Ionizing Radiation* and the draft *Code of Practice for Radiation Protection in the Use of Ionizing Radiation by Chiropractors* were each released for a period of public consultation during the year and will be finalised in the next reporting year.

The Committee considered a draft RHC Statement to assist crematorium and funeral parlour workers in the safe handling of corpses containing radioactive material and to replace RHS 18, *Code of practice for the safe handling of corpses containing radioactive materials* (NHMRC 1986). The Committee will approve the final draft of the RHC Statement out-of-session and RHS 18 will be withdrawn following its publication.

The Committee considered a draft *Scoping Report on Industrial Radiation Protection Training in Australia prepared by Government Skills Australia*, and which set out a proposal for the incorporation of radiation protection into the national vocational education and training system. The Committee endorsed in principle the incorporation of some aspects of radiation protection into the national training system. The Committee proposed that a working group be established to progress the development of core competencies and to oversee the competency standards should a nationally recognised system of core competencies be implemented.

The Committee considered matters in relation to:

- cost-sharing with jurisdictions for employment of consultants to develop Regulatory Impact Statements
- summary reports of radiation incidents reported to the Australian Radiation Incident Register for the 2007 calendar year
- the regulatory process of the Therapeutic Goods Administration for medical devices and, in particular, its inclusion of intense pulsed lasers
- ARPANSA's progress on the Council of Australian Government's recommendation on offences and penalties for the illegal possession, use and transport of radioactive material
- recent developments in establishing a national system for security background checking to assist in implementing the *Code of Practice for the Security of Radioactive Sources* (ARPANSA 2007) and AusCheck's role of providing a centralised security background checking service
- a briefing on the 56<sup>th</sup> session of UNSCEAR held in Vienna, Austria in July 2008
- a briefing on an International Workshop on Intermediate Depth Disposal of Radioactive Waste held in Gyeongju, Korea in December 2008.

At each meeting, the Committee was briefed on developments in the IAEA publication program, and on ICRP and UNSCEAR meetings. Committee members provided comments on several drafts of the IAEA Safety Standards Series documents. The Committee was also briefed on activities of the Radiation Health and Safety Advisory Council and the Nuclear Safety Committee.

## Operations of the Nuclear Safety Committee

December 2008 saw the end of the third triennium of the Nuclear Safety Committee. Mr Jim Hondros, representing the interests of the general public, Professor Marcela Bilek and Professor Peter Johnston finished their tenure on the Committee. The Committee Membership for the 2009-11 triennium is:

*Chair:*

Mr Don Macnab

*CEO of ARPANSA (Acting):*

Mr Peter Burns

*Radiation Health Committee representative:*

Dr Barbara Shields

*Local Government representative:*

Mr Ian Drinnan (NSW)

*Person to represent the interests of the general public:*

Mr Christopher Tola

*Other members:*

Dr Rob Lee

Mr Robert Lyon

Dr Neil McDonald

Prof Rob Melchers

Emeritus Professor Ian Polmear

Dr Tamie Weaver

Dr Denise Wheeler

The Nuclear Safety Committee met twice during 2008-09, on 17 October 2008 and 1 May 2009. The October 2008 meeting was held at Kareela and was in the form of a workshop during which several presentations were made to the Members relating to the regulatory review of safety management systems. The May 2009 meeting was held at Miranda. Meeting summaries were posted on the ARPANSA web site.

During the October 2008 meeting, the Committee considered and discussed safety management systems relating to electricity supply, civil aviation, OPAL, non-reactor nuclear safety and the plans and arrangements of other ARPANSA licensees. Members agreed that the workshop was beneficial and that similar meetings be held again in future.

The Committee also finalised the report of the 3<sup>rd</sup> triennium, which has subsequently been placed on the website at **[www.arpansa.gov.au/pubs/nsc/3rdtri\\_nsc.pdf](http://www.arpansa.gov.au/pubs/nsc/3rdtri_nsc.pdf)**.

At the 1 May 2009 meeting, the Committee received briefings on several issues including:

- nuclear safety in the context of the role of ARPANSA and its statutory responsibilities
- the scope of nuclear regulation currently undertaken by ARPANSA
- the current international issues in nuclear safety.

Briefings on the progress of the OPAL Reactor, meetings of the Radiation Health and Safety Advisory Council and meetings of the Radiation Health Committee were provided at both meetings. The Committee also discussed the scope of the program for the Nuclear Safety Committee over the next three years.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Code of Practice for Safe Transport of Radioactive Material* – 2008 Edition, Radiation Protection Series No 2.



## Appendix 9: Publications

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Safety Guide for Safe Transport of Radioactive Material*, Radiation Protection Series No 2.1.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Safety Guide for Radiation Protection in Diagnostic and Interventional Radiology*, Radiation Protection Series No 14.1.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Safety Guide for Radiation Protection in Nuclear Medicine*, Radiation Protection Series No 14.2.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Safety Guide for Radiation Protection in Radiotherapy*, Radiation Protection Series No 14.3.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Safety Guide for Management of Naturally Occurring Radioactive Material (NORM)*, Radiation Protection Series No 15.

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2008. *Safety Guide for the Predisposal Management of Radioactive Waste*, Radiation Protection Series No 16.

Barnes EM, Long SA and Tinker RA. *Difficulties in obtaining an HPGe detector for low-level measurements*. Applied Radiation and Isotopes Volume 67, Issue 5, (2009).

Gies P, Glanz K, O’Riordan D, Elliot T, Nehl E. *Measured Occupational Solar UVR Exposures of Lifeguards in Pool Settings*. Am J Indust 52:645–653, 2009.

Gies P, Watzl R, Javorniczky J, Roy C, Henderson S, Ayton J and Kingston M. *Measurement of the UVR Exposures of Expeditioners on Antarctic Resupply Voyages*. Photochem Photobiol. (in Press) June 2009.

Glanz K, McCarty F, Nehl E, O’Riordan DL, Gies P, Bundy L, Locke A and Hall DM. *Validity of Self-Reported Sunscreen Use by Parents, Children and Lifeguards*. Am. J. Prev. Med. 36:63-69, 2009.

Gordon L, Hirst NG, Gies PHF and Green AC. *What impact would effective solarium regulations have in Australia?* Med J Aust 189 (No.7):375-377, 2008.

Grzechnik G, Tinker RA, Solomon S. *Evaluation of ARGOS for use in Australia*. ARPANSA Technical Report 150 (2008).

Hardege L. *Environmental Radioactivity Monitoring in Australia 2005 and 2006*. ARPANSA Technical Report 149 (2008).

Hatch KL, Block L and Gies P. *Photoprotection by Fabric*. In ‘Clinical Guide to Sunscreens and Photoprotection’ Eds. Henry W. Lim and Zoe D. Draelos, Dec 2008, pp 221-240.

Hirst N, Gordon L, Gies P and Green AC. (2009) *Estimation of avoidable skin cancers and cost-savings to government associated with regulation of the solarium industry in Australia*. Health Policy 89:303-311.

Long SA, Sdraulig S, Hardege L and McLeish J. *The Radioactive Content of Some Australian Drinking Waters*. ARPANSA Technical Report 148 (2008).

O’Riordan DL, Nehl E, Gies P, Bundy L, Burgess K, Davis E and Glanz K. (2008) *Validity of Covering-Up Sun Protection Habits: Association of Observations and Self-Report*. J. Am. Acad. Dermatol. 60:739-744, 2008.

Tully MB, Klekociuk AR, Deschamps LL, Henderson SI, Krummel PB, Fraser PJ, Shankin JD, Downey AH, Gies HP and Javorniczky J. *The 2007 Antarctic Ozone Hole*. Australian Meteorological Magazine. 57:279-298, 2008.



**Appendix 10: Financial Statements for the Year Ended 30 June 2009**


Australian Radiation Protection and Nuclear  
Safety Agency  
(ARPANSA)

Financial Statements - 30 June 2009



## STATEMENT BY THE CHIEF EXECUTIVE AND CHIEF FINANCIAL OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2009 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*, as amended.

Signed  .....

Peter Burns  
A/Chief Executive

9 September 2009

Signed  .....

Catherine Johns  
A/Chief Financial Officer

9 September 2009

**INCOME STATEMENT***for the year ended 30 June 2009*

	Notes	2009 \$	2008 \$
<b>INCOME</b>			
<b>Revenue</b>			
Revenue from Government	3A	15,616,000	15,795,000
Sale of goods and rendering of services	3B	5,479,718	5,005,245
Licence fees	3C	3,501,727	3,966,154
<b>Total revenue</b>		<b>24,597,445</b>	<b>24,766,399</b>
<b>Gains</b>			
Sale of assets	3D	-	285
Foreign exchange	3E	2,119	-
Other gains	3F	58,240	62,070
<b>Total gains</b>		<b>60,359</b>	<b>62,355</b>
<b>Total Income</b>		<b>24,657,804</b>	<b>24,828,754</b>
<b>EXPENSES</b>			
Employee benefits	4A	14,383,206	14,729,237
Suppliers	4B	8,633,059	7,418,941
Depreciation and amortisation	4C	1,796,472	1,196,274
Write-down and impairment of assets	4D	44,613	47,558
Foreign exchange losses	4E	-	2,919
<b>Total Expenses</b>		<b>24,857,350</b>	<b>23,394,929</b>
<b>Surplus / (Deficit)</b>		<b>(199,546)</b>	<b>1,433,825</b>

The above statement should be read in conjunction with the accompanying notes.

**BALANCE SHEET***as at 30 June 2009*

	Notes	2009 \$	2008 \$
<b>ASSETS</b>			
<b>Financial Assets</b>			
Cash and cash equivalents	5A	2,649,002	2,328,211
Trade and other receivables	5B	5,208,452	8,023,412
Other financial assets	5C	481,074	336,839
<b>Total financial assets</b>		<b>8,338,528</b>	<b>10,688,462</b>
<b>Non-Financial Assets</b>			
Land and buildings	6A	8,604,767	8,946,918
Infrastructure, plant and equipment	6B,6F	7,666,883	4,781,470
Intangibles	6C,6G	786,488	801,798
Inventories	6D	1,772,941	1,620,703
Other non-financial assets	6E	321,944	265,468
<b>Total non-financial assets</b>		<b>19,153,023</b>	<b>16,416,357</b>
<b>Total Assets</b>		<b>27,491,551</b>	<b>27,104,819</b>
<b>LIABILITIES</b>			
<b>Payables</b>			
Suppliers	7A	492,940	330,212
Other payables	7B	619,399	431,952
<b>Total payables</b>		<b>1,112,339</b>	<b>762,164</b>
<b>Provisions</b>			
Employee provisions	8	5,019,834	4,409,165
<b>Total provisions</b>		<b>5,019,834</b>	<b>4,409,165</b>
<b>Total Liabilities</b>		<b>6,132,173</b>	<b>5,171,329</b>
<b>Net Assets</b>		<b>21,359,378</b>	<b>21,933,490</b>
<b>EQUITY</b>			
Contributed equity		4,624,000	4,624,000
Reserves		5,269,493	5,644,059
Retained surplus		11,465,885	11,665,431
<b>Total Equity</b>		<b>21,359,378</b>	<b>21,933,490</b>
<b>Current Assets</b>		<b>10,433,413</b>	<b>12,574,633</b>
<b>Non-Current Assets</b>		<b>17,058,138</b>	<b>14,530,186</b>
<b>Current Liabilities</b>		<b>5,763,393</b>	<b>4,846,636</b>
<b>Non-Current Liabilities</b>		<b>368,780</b>	<b>324,693</b>

The above balance sheet should be read in conjunction with the accompanying notes.

**STATEMENT OF CHANGES IN EQUITY**  
*for the year ended 30 June 2009*

**Opening balance**

Balance carried forward from previous period

**Income and expense**

Revaluations recognised directly in equity

**Sub-total income and expenses recognised directly in equity**

Surplus (Deficit) for the period

**Total income and expenses**

**Contributions by Owners**

Appropriation (equity injection)

**Sub-total transactions with owners**

**Closing balance as at 30 June**

Retained Earnings	Asset Revaluation Reserves		Contributed Equity/Capital		Total Equity	
	2009	2008	2009	2008	2009	2008
\$	\$	\$	\$	\$	\$	\$
<b>11,665,431</b>	<b>10,231,606</b>	<b>5,644,059</b>	<b>4,624,000</b>	<b>1,024,000</b>	<b>21,933,490</b>	<b>16,899,665</b>
-	-	(374,566)	-	-	(374,566)	-
-	-	(374,566)	-	-	(374,566)	-
(199,546)	1,433,825	-	-	-	(199,546)	1,433,825
(199,546)	1,433,825	-	-	-	(199,546)	1,433,825
-	-	-	-	-	-	-
-	-	-	-	3,600,000	-	3,600,000
-	-	-	-	3,600,000	-	3,600,000
<b>11,465,885</b>	<b>11,665,431</b>	<b>5,269,493</b>	<b>4,624,000</b>	<b>4,624,000</b>	<b>21,359,378</b>	<b>21,933,490</b>

The above statement should be read in conjunction with the accompanying notes.

# CASH FLOW STATEMENT

for the year ended 30 June 2009

	Notes	2009 \$	2008 \$
<b>OPERATING ACTIVITIES</b>			
<b>Cash received</b>			
Goods and services		9,907,434	9,521,455
Appropriations		15,295,000	16,097,000
Net GST recovered		660,180	288,520
<b>Total cash received</b>		<u>25,862,614</u>	<u>25,906,975</u>
<b>Cash used</b>			
Employees		(14,105,307)	(14,292,468)
Suppliers		(9,392,913)	(9,399,471)
<b>Total cash used</b>		<u>(23,498,220)</u>	<u>(23,691,939)</u>
<b>Net cash from operating activities</b>	9	<u>2,364,394</u>	<u>2,215,036</u>
<b>INVESTING ACTIVITIES</b>			
<b>Cash used</b>			
Purchase of property, plant and equipment		(4,592,751)	(2,280,771)
Purchase of intangibles		(150,852)	(153,800)
<b>Total cash used</b>		<u>(4,743,603)</u>	<u>(2,434,571)</u>
<b>Net cash (used by) investing activities</b>		<u>(4,743,603)</u>	<u>(2,434,571)</u>
<b>FINANCING ACTIVITIES</b>			
<b>Cash received</b>			
Appropriations - contributed equity		2,700,000	400,000
<b>Total cash received</b>		<u>2,700,000</u>	<u>400,000</u>
<b>Net cash from financing activities</b>		<u>2,700,000</u>	<u>400,000</u>
<b>Net increase or (decrease) in cash held</b>		<u>320,791</u>	<u>180,465</u>
Cash at the beginning of the reporting period		2,328,211	2,147,746
<b>Cash at the end of the reporting period</b>	5A	<u>2,649,002</u>	<u>2,328,211</u>

The above statement should be read in conjunction with the accompanying notes.

## SCHEDULE OF COMMITMENTS

as at 30 June 2009

	2009	2008
	\$	\$
<b>BY TYPE</b>		
<b>Commitments receivable</b>		
GST recoverable on commitments	(199,167)	(349,492)
<b>Total commitments receivable</b>	<u>(199,167)</u>	<u>(349,492)</u>
<b>Capital commitments</b>		
Infrastructure, plant and equipment	-	2,105,838
Intangibles	527,572	-
<b>Total capital commitments</b>	<u>527,572</u>	<u>2,105,838</u>
<b>Other commitments</b>		
Operating leases	272,740	641,981
Other commitments	1,390,522	1,096,595
<b>Total other commitments</b>	<u>1,663,262</u>	<u>1,738,576</u>
<b>Net commitments by type</b>	<u><u>1,991,667</u></u>	<u><u>3,494,922</u></u>
<b>BY MATURITY</b>		
<b>Other commitments receivable</b>		
One year or less	(171,102)	(269,935)
From one to five years	(28,065)	(79,557)
<b>Total other commitments receivable</b>	<u>(199,167)</u>	<u>(349,492)</u>
<b>Commitments payable</b>		
<b>Capital commitments</b>		
One year or less	432,772	1,907,620
From one to five years	94,800	198,218
<b>Total capital commitments</b>	<u>527,572</u>	<u>2,105,838</u>
<b>Operating lease commitments</b>		
One year or less	264,911	395,179
From one to five years	7,829	246,802
<b>Total operating lease commitments</b>	<u>272,740</u>	<u>641,981</u>
<b>Other commitments</b>		
One year or less	1,184,441	666,492
From one to five years	206,081	430,103
<b>Total other commitments</b>	<u>1,390,522</u>	<u>1,096,595</u>
<b>Net commitments by maturity</b>	<u><u>1,991,667</u></u>	<u><u>3,494,922</u></u>

NB: Commitments are GST inclusive where relevant.

Other commitments - contracts for the procurement of goods and services

Operating leases are effectively non-cancellable and comprise:

### ***Leases for office accommodation.***

Lease payments are subject to annual increase as per the lease. The lease term is 3 years.

### ***Agreements for the provision of motor vehicles to senior executive officers.***

No contingent rentals exist. There are no renewal or purchase options available to the Agency.

The above schedule should be read in conjunction with the accompanying notes.

## SCHEDULE OF CONTINGENCIES

*as at 30 June 2009*

Contingent Assets	TOTAL	
	2009	2008
	\$	\$
Total Contingent Assets	-	-
Contingent Liabilities	TOTAL	
	2009	2008
	\$	\$
Total Contingent Liabilities	-	-
Net Contingent Assets (Liabilities)	-	-

The above schedule should be read in conjunction with the accompanying notes.



**NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS**  
***for the year ended 30 June 2009***

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Note 1: Summary of Significant Accounting Policies

Note 2: Events after the Balance Sheet Date

Note 3: Income

Note 4: Expenses

Note 5: Financial Assets

Note 6: Non-Financial Assets

Note 7: Payables

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Note 10: Contingent Liabilities and Assets

Note 11: Executive Remuneration

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Note 13: Compensation and Debt Relief

Note 14: Financial Instruments

Note 15: Appropriations

Note 16: Special Accounts

Note 17: Reporting of Outcomes

### **Note 1: Summary of Significant Accounting Policies**

#### **1.1 Objectives of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)**

The objectives of ARPANSA are described in the body of this Annual Report.

The Agency is structured to meet one Outcome:

"The Australian people and the environment are protected from the harmful effects of radiation."

ARPANSA's activities contributing toward the outcome are classified as departmental. Departmental activities involve the use of assets, liabilities, revenues and expenses controlled or incurred by the Agency in its own right.

Departmental activities are identified under 3 Outputs:

1. National leadership in radiation protection and nuclear safety.
2. Knowledge, information and services relating to radiation protection and nuclear safety.
3. Regulation of Commonwealth entities using radiation sources and facilities or nuclear installations.

The continued existence of the Agency in its present form and with its present programs is dependent on Government policy and on continuing appropriations by Parliament for the Agency's administration and programs.

#### **1.2 Basis of Preparation of the Financial Report**

The financial statements and notes are required by section 49 of the *Financial Management and Accountability Act 1997* and are a general purpose financial report.

The financial statements and notes have been prepared in accordance with:

- Finance Minister's Orders (or FMOs) for reporting periods ending on or after 1 July 2008; and
- Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board that apply for the reporting period.

The financial report has been prepared on an accrual basis and is in accordance with historical cost convention, except for certain assets at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial report is presented in Australian dollars and values are rounded to the nearest dollar.

Unless an alternative treatment is specifically required by an accounting standard or the FMOs, assets and liabilities are recognised in the Balance Sheet when and only when it is probable that future economic benefits will flow to the Agency and the amounts of the assets or liabilities can be reliably measured. However, assets and liabilities arising under agreements equally proportionately unperformed are not recognised unless required by an accounting standard. Liabilities and assets that are unrealised are reported in the Schedule of Commitments and the Schedule of Contingencies.

Unless alternative treatment is specifically required by an accounting standard, revenues and expenses are recognised in the Income Statement when and only when the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

### **1.3 Significant Accounting Judgements and Estimates**

In the process of applying the accounting policies listed in this note, ARPANSA has made the following judgements that have the most significant impact on the amounts recorded in the financial statements:

- The fair value of land and buildings has been taken to be the market value of similar properties as determined by an independent valuer. However, ARPANSA's buildings are purpose built and may in fact realise more or less in the market.

No accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to carrying amounts of assets and liabilities within the next accounting period.

### **1.4 Changes in Australian Accounting Standards**

#### **Adoption of new Australian Accounting Standard requirements**

No accounting standard has been adopted earlier than the application date stated in the standard. New standards, revised or amending standards and interpretations that were issued prior to the signing of the statement by the chief executive and chief financial officer and are applicable to the current reporting period did not have a financial impact, and are not expected to have a future financial impact on the entity.

#### **Future Australian Accounting Standard requirements**

New standards, revised or amending standards and interpretations that were issued prior to the signing of the statement by the Chief Executive and Chief Financial Officer and are applicable to the future reporting period are not expected to have a future financial impact on the entity.

### **1.5 Revenue**

#### ***Revenue from Government***

Amounts appropriated for departmental outputs appropriations for the year (adjusted for any formal additions and reductions) are recognised as revenue, except for certain amounts that relate to activities that are reciprocal in nature, in which case revenue is recognised only when it has been earned.

Section 56 (3) of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act), requires that money appropriated by the Parliament be transferred to the special account (notes 3A and 16 refer).

Appropriations receivable are recognised at their nominal amounts.

#### ***Resources Received Free of Charge***

Resources received free of charge are recognised as revenue when and only when a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Resources received free of charge are recorded as either revenue or gains depending on their nature.

### ***Licence Fees***

Under paragraph 34(b) of the Act, an application for a licence must be accompanied by a fee prescribed in the regulations. Revenue for licence applications is recognised when an application for a licence is received.

Revenue for annual licence fees is recognised when a licence is issued to the licensee.

### ***Other Types of Revenue***

Revenue from the sale of goods is recognised when:

- The risks and rewards of ownership have been transferred to the buyer;
- The seller retains no managerial involvement nor effective control over the goods;
- The revenue and transaction costs incurred can be reliably measured; and
- It is probable that the economic benefits associated with the transaction will flow to the Agency.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

- The amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
- The probable economic benefits with the transaction will flow to the Agency.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any allowances for bad and doubtful debts. Collectability of debts is reviewed at balance date. Allowances are made when collectability of the debt is no longer probable.

## **1.6 Gains**

### ***Other Resources Received Free of Charge***

Contributions of assets at no cost of acquisition or for nominal consideration are recognised as gains at their fair value when the asset qualifies for recognition, unless received from another Government Agency or Authority as a consequence of a restructuring of administrative arrangements.

Resources received free of charge are recorded as either revenue or gains depending on their nature.

### ***Sale of Assets***

Gains from disposal of non-current assets are recognised when control of the asset has passed to the buyer.

## **1.7 Transactions with the Government as Owner**

### ***Contributed Equity***

Amounts appropriated which are designated as 'equity injections' for a year (less any formal reductions) are recognised directly in Contributed equity in that year.

## **1.8 Employee Benefits**

Liabilities for services rendered by employees are recognised at the reporting date to the extent that they have not been settled.

Liabilities for 'short-term employee benefits' (as defined in AASB 119) and termination benefits due within twelve months of balance date are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

All other employee benefit liabilities are measured at the present value of the estimated future cash outflows to be made in respect of services provided by employees up to the reporting date.

### ***Leave***

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Agency is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration, including the Agency's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave is recognised and measured at the present value of the estimated future cash flows to be made in respect of employees as at 30 June 2009. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

### ***Superannuation***

The majority of staff of ARPANSA are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS) or the PSS accumulation plan (PSSap), and the Australian Government Employee Superannuation Trust (AGEST). There are a small number of staff covered under various other superannuation schemes.

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme. The AGEST Superannuation Trust is an industry fund which was previously the Australian Government Default Superannuation fund for non-ongoing employees.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported by the Department of Finance and Deregulation as an administered item.

ARPANSA makes employer contributions to the Employee Superannuation Scheme at rates determined by an actuary to be sufficient to meet the cost to the Government of the superannuation entitlements of the Agency's employees. ARPANSA accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final fortnight of the year.

## **1.9 Leases**

A distinction is made between finance leases and operating leases. Finance leases effectively transfer from the lessor to the lessee substantially all the risks and rewards incidental to ownership of leased non-current assets. An operating lease is a lease that is not a finance lease. In operating leases, the lessor effectively retains substantially all such risks and benefits.

Where a non-current asset is acquired by means of a finance lease, the asset is capitalised at either the fair value of the lease property or, if lower, the present value of minimum lease payments at the inception of the contract and a liability is recognised at the same time and for the same amount.

The discount rate used is the interest rate implicit in the lease. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

Operating lease payments are expensed on a straight line basis which is representative of the pattern of benefits derived from the leased assets.

## **1.10 Borrowing Costs**

All borrowing costs are expensed as incurred.

## **1.11 Cash**

Cash means notes and coins held and any deposits held at call with a bank or financial institution. Cash is recognised at its nominal amount.

### 1.12 Financial assets

ARPANSA classifies its financial assets as 'loans and receivables'. Financial assets are recognised and derecognised at transaction date.

#### Loans and receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. They are included in current assets, except for maturities greater than 12 months after the balance sheet date. These are classified as non-current assets. Loans and receivables are measured at cost, less impairment.

### 1.13 Financial liabilities

Financial liabilities are classified as 'Other liabilities'. Financial liabilities are recognised and derecognised at transaction date.

#### Supplier and other payables

Supplier and other payables are recognised at cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

### 1.14 Contingent Liabilities and Contingent Assets

Contingent liabilities and contingent assets are not recognised in the Balance Sheet but are reported in the relevant schedules and notes. They may arise from uncertainty as to the existence of a liability or asset, or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are reported when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

### 1.15 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and revenues at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor Agency's accounts immediately prior to the restructuring.

### 1.16 Property, Plant and Equipment

#### *Asset Recognition Threshold*

Purchases of property, plant and equipment are recognised initially at cost in the Balance Sheet, except for purchases costing less than \$2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

#### *Revaluations*

Fair values for each class of asset are determined as shown below:

Asset class	Fair value measured at:
Land	Market value
Buildings exc. Leasehold improvements	Market value
Leasehold improvements	Depreciated replacement cost
Plant & equipment	Market value

Following initial recognition at cost, property plant and equipment are carried at fair value less accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets. However at a minimum, ARPANSA's infrastructure, property, plant and equipment are subject to an independent valuation every four years, by a qualified valuer.

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reverses a previous revaluation decrement of the same asset class that was previously recognised through surplus and deficit. Revaluation decrements for a class of assets are recognised directly through surplus and deficit except to the extent that they reverse a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount.

### ***Depreciation***

Depreciable property plant and equipment assets, apart from computer equipment, are written-off to their estimated residual values over their estimated useful lives to ARPANSA, using the straight-line method of depreciation. Computer equipment is depreciated using the reducing balance method, as the resulting depreciation pattern more accurately reflects the reduction in fair value over the life of these assets. Leasehold improvements are depreciated using the straight line method over the lesser of the estimated useful life of the improvements or the unexpired period of the lease.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

	<b>2009</b>	<b>2008</b>
Buildings on freehold land	<b>34 years</b>	34 years
Leasehold improvements	<b>Lease term</b>	Lease term
Plant and equipment	<b>3 months to 27 years</b>	3 months to 27 years

### ***Impairment***

All assets were assessed for impairment at 30 June 2009. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if ARPANSA were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

### **1.17 Intangibles**

ARPANSA's intangibles comprise internally developed software for internal use and trade marks. These assets are carried at cost.

Intangibles are amortised on a straight-line basis over their anticipated useful life. The useful lives of ARPANSA's intangibles are 5 to 14 years (2007-08: 5 to 14 years).

All intangibles assets were assessed for indications of impairment as at 30 June 2009.

### **1.18 Inventories**

Inventories held for sale are valued at the lower of cost and net realisable value.

Inventories held for distribution are measured at the lower of cost and current replacement cost.

Costs incurred in bringing each item of inventory to its present location and condition are assigned as follows:

- raw materials and stores – purchase cost on a first-in-first-out basis; and
- finished goods and work in progress – cost of direct materials and labour plus attributable costs that are capable of being allocated on a reasonable basis.

Inventories acquired at no cost or nominal consideration are measured at current replacement cost at the date of acquisition.

#### **1.19 Taxation**

The Agency is exempt from all forms of taxation except fringe benefits tax (FBT) and the goods and services tax (GST).

Revenues, expenses and assets are recognised net of GST, except:

- where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- for receivables and payables.

#### **1.20 Reporting of Outcomes**

The activities of the Agency and the associated transactions are reported under 3 output groups (note 17B refers).

### **Note 2: Events after the Balance Sheet Date**

No significant after balance date events have occurred.

### Note 3: Income

	2009	2008
<u>Revenue</u>	\$	\$

#### Note 3A: Revenue from Government

Appropriation:

Departmental outputs	15,616,000	15,795,000
<b>Total revenue from Government</b>	<b>15,616,000</b>	<b>15,795,000</b>

#### Note 3B: Sale of goods and rendering of services

Scientific services - PRMS	2,453,852	2,429,432
Construction and maintenance contracts - CTBT	1,443,329	1,073,055
Other scientific services	1,582,537	1,502,758
<b>Total sale of goods and rendering of services</b>	<b>5,479,718</b>	<b>5,005,245</b>

Related entities	404,248	151,384
External entities	5,075,470	4,853,861
<b>Total sale of goods and rendering of services</b>	<b>5,479,718</b>	<b>5,005,245</b>

#### Note 3C: Licence fees

Application fees	74,660	64,601
Annual charges	3,427,067	3,901,553
<b>Total fees</b>	<b>3,501,727</b>	<b>3,966,154</b>

#### Gains

#### Note 3D: Sale of Assets

Infrastructure, plant and equipment		
Proceeds from sale	-	1,600
Carrying value of assets sold	-	(1,315)
<b>Net gain from sale of assets</b>	<b>-</b>	<b>285</b>

#### Note 3E: Foreign exchange

Non-speculative	2,119	-
<b>Total foreign exchange losses</b>	<b>2,119</b>	<b>-</b>

#### Note 3F: Other gains

Resources received free of charge	58,240	62,070
<b>Total other gains</b>	<b>58,240</b>	<b>62,070</b>



## Note 4: Expenses

	2009 \$	2008 \$
<b>Note 4A: Employee benefits</b>		
Wages and salaries	10,288,150	9,706,116
Superannuation - defined contribution plans	1,928,181	1,802,551
Leave and other entitlements	2,121,363	1,894,778
Separation and redundancies	45,512	1,325,792
<b>Total employee benefits</b>	<b>14,383,206</b>	<b>14,729,237</b>
<b>Note 4B: Suppliers</b>		
Provision of goods – external entities	1,569,031	1,515,278
Rendering of services – related entities	1,274,640	1,193,424
Rendering of services – external entities	5,354,836	4,269,788
Operating lease rentals:		
Minimum lease payments	363,076	373,640
Workers compensation premiums	71,476	66,811
<b>Total supplier expenses</b>	<b>8,633,059</b>	<b>7,418,941</b>
<b>Note 4C: Depreciation and amortisation</b>		
Depreciation:		
Infrastructure, plant and equipment	1,237,584	682,435
Buildings	299,562	285,417
<b>Total depreciation</b>	<b>1,537,146</b>	<b>967,852</b>
Amortisation:		
Intangibles:		
Computer software	258,996	228,092
Other	330	330
<b>Total amortisation</b>	<b>259,326</b>	<b>228,422</b>
<b>Total depreciation and amortisation</b>	<b>1,796,472</b>	<b>1,196,274</b>
<b>Note 4D: Write-down and impairment of assets</b>		
Bad and doubtful debt expense	13,780	36,421
Plant and equipment - write-off	30,833	11,137
<b>Total write-down and impairment of assets</b>	<b>44,613</b>	<b>47,558</b>
<b>Note 4E: Foreign exchange losses</b>		
Non-speculative	-	2,919
<b>Total foreign exchange losses</b>	<b>-</b>	<b>2,919</b>

## Note 5: Financial Assets

	2009	2008
	\$	\$
<b><u>Note 5A: Cash and cash equivalents</u></b>		
Special accounts	2,646,002	2,325,211
Cash on hand or on deposit	3,000	3,000
<b><i>Total cash and cash equivalents</i></b>	<b>2,649,002</b>	<b>2,328,211</b>
<b><u>Note 5B: Trade and other receivables</u></b>		
Goods and services	604,859	1,002,426
Appropriations receivable:		
for existing outputs	4,616,000	6,995,000
GST receivable from the Australian Taxation Office	77,491	102,104
<b><i>Total trade and other receivables (gross)</i></b>	<b>5,298,350</b>	<b>8,099,530</b>
Less Allowance for doubtful debts:		
Goods and services	(89,898)	(76,118)
<b><i>Total trade and other receivables (net)</i></b>	<b>5,208,452</b>	<b>8,023,412</b>
Receivables are aged as follows:		
Not overdue	5,100,150	7,575,163
Overdue by:		
Less than 30 days	104,224	381,670
30 to 60 days	43,463	41,823
61 to 90 days	7,245	30,785
More than 90 days	43,268	70,089
<b><i>Total receivables (gross)</i></b>	<b>5,298,350</b>	<b>8,099,530</b>
The allowance for doubtful debts is aged as follows:		
Overdue by:		
30 to 60 days	39,385	
61 to 90 days	7,245	6,029
More than 90 days	43,268	70,089
<b><i>Total allowance for doubtful debts</i></b>	<b>89,898</b>	<b>76,118</b>
Receivables are represented by:		
Current	5,208,452	8,023,412
<b><i>Total trade and other receivables (net)</i></b>	<b>5,208,452</b>	<b>8,023,412</b>
<b><u>Note 5C: Other financial assets</u></b>		
Accrued revenue	481,074	336,839
<b><i>Total other financial assets</i></b>	<b>481,074</b>	<b>336,839</b>

## Note 6: Non-Financial Assets

	2009 \$	2008 \$
<b><u>Note 6A: Land and buildings</u></b>		
Freehold land (at fair value)	<u>3,900,000</u>	<u>4,050,000</u>
Buildings on freehold land:		
- work in progress	322,782	-
- fair value	4,315,000	4,850,864
- accumulated depreciation	-	(158,783)
<b><i>Total buildings on freehold land</i></b>	<u>4,637,782</u>	<u>4,692,081</u>
Leasehold improvements		
- fair value	331,471	331,471
- accumulated amortisation	(264,486)	(126,634)
<b><i>Total leasehold improvements</i></b>	<u>66,985</u>	<u>204,837</u>
<b><i>Total land and buildings (non-current)</i></b>	<u>8,604,767</u>	<u>8,946,918</u>

## **Note 6B: Infrastructure, plant and equipment**

Infrastructure, plant and equipment:		
- work in progress	190,872	531,846
- fair value	9,346,414	4,929,010
- accumulated depreciation	(1,870,403)	(679,386)
<b><i>Total infrastructure, plant and equipment (non-current)</i></b>	<u>7,666,883</u>	<u>4,781,470</u>

All revaluations are conducted in accordance with the revaluation policy stated at Note 1. In 2008-09 independant valuer Edward Kinch (AAPI) from the Australian Valuation Office conducted the revaluation of land and buildings. The previous revaluation was conducted, by independent valuers Ty Noble (AAPI) and Edward Kinch (AAPI) from the Australian Valuation Office in 2006-07.

There are no indicators of impairment for non-financial assets.

## Note 6: Non-Financial Assets (continued)

	2009	2008
	\$	\$
<b><u>Note 6C: Intangibles</u></b>		
Computer software at cost:		
Externally acquired	975,673	836,797
Accumulated amortisation	(618,492)	(485,317)
Internally developed – in progress	95,140	-
Internally developed – in use	579,106	579,106
Accumulated amortisation	(246,758)	(130,937)
	<u>784,669</u>	<u>799,649</u>
Trademarks at cost:		
Trademarks	4,620	4,620
Accumulated amortisation	(2,801)	(2,471)
	<u>1,819</u>	<u>2,149</u>
<b><i>Total intangibles (non-current)</i></b>	<b><u>786,488</u></b>	<b><u>801,798</u></b>

No indicators of impairment were found for intangible assets.

### **Note 6D: Inventories**

Inventories held for sale		
Finished goods	100,084	10,060
Inventories held for distribution	1,672,857	1,610,643
<b><i>Total inventories (current)</i></b>	<b><u>1,772,941</u></b>	<b><u>1,620,703</u></b>

### **Note 6E: Other non-financial assets**

Prepayments	321,944	265,468
<b><i>Total other non-financial assets</i></b>	<b><u>321,944</u></b>	<b><u>265,468</u></b>

All other non-financial assets are current assets.

# **Note 6: Non-Financial Assets (continued)**

Note 6F: Analysis of property, plant and equipment

**TABLE A – Reconciliation of the opening and closing balances of property, plant and equipment (2008-09)**

	Land \$	Buildings \$	Leasehold Improvements \$	Other IP & E \$	Total \$
<b>As at 1 July 2008</b>					
Gross book value	4,050,000	4,850,864	331,471	5,460,856	14,693,191
Accumulated depreciation/amortisation	-	(158,783)	(126,634)	(679,386)	(964,803)
<b>Net book value 1 July 2008</b>	<b>4,050,000</b>	<b>4,692,081</b>	<b>204,837</b>	<b>4,781,470</b>	<b>13,728,388</b>
Additions:					
by purchase	-	331,977	-	4,107,263	4,439,240
Revaluations and impairments through equity	(150,000)	(224,566)	-	-	(374,566)
Depreciation/amortisation expense	-	(161,710)	(137,852)	(1,191,017)	(1,490,579)
Disposals:					
Other disposals	-	-	-	(30,833)	(30,833)
<b>Net book value 30 June 2009</b>	<b>3,900,000</b>	<b>4,637,782</b>	<b>66,985</b>	<b>7,666,883</b>	<b>16,271,650</b>

**Net book value as of 30 June 2009 represented by:**

Gross book value	3,900,000	4,637,782	331,471	9,537,286	18,406,539
Accumulated depreciation/amortisation	-	-	(264,486)	(1,870,403)	(2,134,889)
	<b>3,900,000</b>	<b>4,637,782</b>	<b>66,985</b>	<b>7,666,883</b>	<b>16,271,650</b>

**TABLE B – Reconciliation of the opening and closing balances of property, plant and equipment (2007-08)**

	Land \$	Buildings \$	Leasehold Improvements \$	Other IP & E \$	Total \$
<b>As at 1 July 2007</b>					
Gross book value	4,050,000	4,681,650	310,900	3,423,524	12,466,074
Accumulated depreciation/amortisation	-	-	-	-	-
<b>Net book value 1 July 2007</b>	<b>4,050,000</b>	<b>4,681,650</b>	<b>310,900</b>	<b>3,423,524</b>	<b>12,466,074</b>
Additions:					
by purchase	-	169,214	20,571	2,049,783	2,239,568
Revaluations and impairments through equity	-	-	-	-	-
Depreciation/amortisation expense	-	(158,783)	(126,634)	(679,386)	(964,803)
Disposals:					
Other disposals	-	-	-	(12,451)	(12,451)
<b>Net book value 30 June 2008</b>	<b>4,050,000</b>	<b>4,692,081</b>	<b>204,837</b>	<b>4,781,470</b>	<b>13,728,388</b>

**Net book value as of 30 June 2008 represented by:**

Gross book value	4,050,000	4,850,864	331,471	5,460,856	14,693,191
Accumulated depreciation/amortisation	-	(158,783)	(126,634)	(679,386)	(964,803)
	<b>4,050,000</b>	<b>4,692,081</b>	<b>204,837</b>	<b>4,781,470</b>	<b>13,728,388</b>

**Note 6G: Intangibles**

**TABLE A: Reconciliation of the opening and closing balances of intangibles (2008-09)**

Item	Computer software internally developed \$	Computer software purchased \$	Other intangibles - Trademarks \$	Total \$
<b>As at 1 July 2008</b>				
Gross book value	579,106	836,797	4,620	1,420,523
Accumulated depreciation/amortisation	(130,937)	(485,317)	(2,471)	(618,725)
<b>Net book value 1 July 2008</b>	<b>448,169</b>	<b>351,480</b>	<b>2,149</b>	<b>801,798</b>
Additions:				
by purchase or internally developed	95,140	138,876	-	234,016
Amortisation	(115,821)	(133,175)	(330)	(249,326)
<b>Net book value 30 June 2009</b>	<b>427,488</b>	<b>357,181</b>	<b>1,819</b>	<b>786,488</b>
<b>Net book value as of 30 June 2009 represented by:</b>				
Gross book value	674,246	975,673	4,620	1,654,539
Accumulated depreciation/amortisation	(246,758)	(618,492)	(2,801)	(868,051)
	<b>427,488</b>	<b>357,181</b>	<b>1,819</b>	<b>786,488</b>

**TABLE B: Reconciliation of the opening and closing balances of intangibles (2007-08)**

Item	Computer software internally developed \$	Computer software purchased \$	Other intangibles - Trademarks \$	Total \$
<b>As at 1 July 2007</b>				
Gross book value	575,028	687,075	4,620	1,266,723
Accumulated depreciation/amortisation	(15,271)	(372,890)	(2,142)	(390,303)
<b>Net book value 1 July 2007</b>	<b>559,757</b>	<b>314,185</b>	<b>2,478</b>	<b>876,420</b>
Additions:				
by purchase or internally developed	4,078	149,722	-	153,800
Amortisation	(115,666)	(112,427)	(329)	(228,422)
<b>Net book value 30 June 2008</b>	<b>448,169</b>	<b>351,480</b>	<b>2,149</b>	<b>801,798</b>
<b>Net book value as of 30 June 2008 represented by:</b>				
Gross book value	579,106	836,797	4,620	1,420,523
Accumulated depreciation/amortisation	(130,937)	(485,317)	(2,471)	(618,725)
	<b>448,169</b>	<b>351,480</b>	<b>2,149</b>	<b>801,798</b>

## Note 7: Payables

	2009	2008
	\$	\$
<b><u>Note 7A: Suppliers</u></b>		
Trade creditors	492,940	330,212
<b><i>Total supplier payables</i></b>	<b>492,940</b>	<b>330,212</b>
Supplier payables are represented by:		
Current	492,940	330,212
<b><i>Total supplier payables</i></b>	<b>492,940</b>	<b>330,212</b>

Settlement is usually made net 30 days.

### **Note 7B: Other payables**

Accrued expenses	619,399	412,567
Unearned income	-	19,385
<b><i>Total other payables</i></b>	<b>619,399</b>	<b>431,952</b>

All other payables are current liabilities.

## Note 8: Provisions

	2009	2008
	\$	\$
<b><u>Employee provisions</u></b>		
Salaries and wages	175,825	117,937
Leave	4,814,929	4,271,173
Superannuation	29,080	20,055
<b><i>Total employee provisions</i></b>	<b>5,019,834</b>	<b>4,409,165</b>
Employee provisions are represented by:		
Current	4,651,054	4,084,472
Non-current	368,780	324,693
<b><i>Total employee provisions</i></b>	<b>5,019,834</b>	<b>4,409,165</b>

## Note 9: Cash Flow Reconciliation

	2009	2008
	\$	\$
<b>Reconciliation of cash and cash equivalents as per Balance Sheet to Cash Flow Statement</b>		
<b>Report cash and cash equivalents as per:</b>		
Cash Flow Statement	2,649,002	2,328,211
Balance Sheet	2,649,002	2,328,211
Difference	-	-
<b>Reconciliation of operating result to net cash from operating activities:</b>		
Operating result	(199,546)	1,433,824
Depreciation / amortisation	1,796,472	1,196,273
Net write down of non-financial assets	44,613	47,558
(Gain) / loss on disposal of assets	-	(285)
(Increase) / decrease in net receivables	114,959	27,465
(Increase) / decrease in inventories	(152,238)	(116,443)
(Increase) / decrease in prepayments	(56,476)	(42,064)
(Increase) / decrease in accrued revenue	(144,235)	127,433
Increase / (decrease) in employee provisions	610,669	(119,958)
Increase / (decrease) in supplier payables	162,729	(227,834)
Increase / (decrease) in accrued expenses	187,447	(110,933)
<b>Net cash from / (used by) operating activities</b>	<b>2,364,394</b>	<b>2,215,036</b>

## Note 10: Contingent Liabilities and Assets

As at 30 June 2009, ARPANSA has no quantifiable or unquantifiable contingencies.

## Note 11: Executive Remuneration

	2009	2008
The number of senior executives who received or were due to receive total remuneration of \$130,000 or more:		
\$130,000 to \$144,999	-	1
\$175,000 to \$189,999	1	1
\$190,000 to \$204,999	1	1
\$205,000 to \$219,999	2	2
\$235,000 to \$249,999	1	-
\$250,000 to \$264,999	1	-
\$265,000 to \$279,999	-	1
<b>Total</b>	<b>6</b>	<b>6</b>
The aggregate amount of total remuneration of executives shown above.		
	<b>\$1,290,192</b>	\$1,223,466
The aggregate amount of separation and redundancy/termination benefit payments during the year to executives shown above.		
	-	-



## Note 12: Remuneration of Auditors

	2009	2008
	\$	\$

Financial statement audit services are provided free of charge to the Agency.

The fair value of the audit services provided was:	<u>58,240</u>	<u>62,070</u>
	<u>58,240</u>	<u>62,070</u>

No other services were provided by the Auditor-General.

## Note 13: Compensation and Debt Relief

No payments were made during the reporting period. (2008: No payments made)

<u>-</u>	<u>-</u>
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## Note 14: Financial Instruments

	2009	2008
	\$	\$

### Note 14A: Categories of financial instruments

#### Financial assets

Loans and receivables		
Cash and cash equivalents	2,649,002	2,328,211
Trade and other receivables (net)	5,208,452	8,023,412
Other financial assets	481,074	336,839
<i>Carrying amount of financial assets</i>	<u>8,338,528</u>	<u>10,688,462</u>

#### Financial liabilities

Other liabilities		
Payables - suppliers	492,940	330,212
Other payables	619,399	431,952
<i>Carrying amount of financial liabilities</i>	<u>1,112,339</u>	<u>762,164</u>

### Note 14B: Fair values of financial assets and liabilities

	2009		2008	
	Total Carrying Amount	Aggregate Fair Value	Total Carrying Amount	Aggregate Fair Value
	\$	\$	\$	\$
<b>Financial assets</b>				
Cash and cash equivalents	2,649,002	2,649,002	2,328,211	2,328,211
Trade and other receivables (net)	5,208,452	5,208,452	8,023,412	8,023,412
Other financial assets	481,074	481,074	336,839	336,839
<i>Total financial assets</i>	<u>8,338,528</u>	<u>8,338,528</u>	<u>10,688,462</u>	<u>10,688,462</u>
<b>Financial liabilities</b>				
Payables - suppliers	492,940	492,940	330,212	330,212
Other payables	619,399	619,399	431,952	431,952
<i>Total financial liabilities</i>	<u>1,112,339</u>	<u>1,112,339</u>	<u>762,164</u>	<u>762,164</u>

## Note 14: Financial Instruments (continued)

### Note 14C: Credit risk exposures

ARPANSA is exposed to minimal credit risk as loans and receivables are cash and trade receivables. The maximum exposure to credit risk is the risk that arises from potential default of a debtor. This amount is equal to the total amount of trade receivables (2009: \$5,208,452 and 2008: \$8,023,412). ARPANSA has assessed the risk of the default on payment and has allocated \$89,898 in 2009 (2008: \$76,118) to an allowance for doubtful debts.

ARPANSA has policies and procedures that guide employees' debt recovery techniques that are to be applied when debts are past due.

ARPANSA holds no collateral to mitigate against credit risk

The table below shows the credit quality of financial instruments not past due or individually determined as impaired.

	Not Past Due Nor Impaired 2009 \$	Not Past Due Nor Impaired 2008 \$	Past due or impaired 2009 \$	Past due or impaired 2008 \$
Cash and cash equivalent	2,649,002	2,328,211	-	-
Trade and other receivables (gross)	5,100,150	7,575,163	198,200	524,367
Other financial assets	481,074	336,839	-	-
<b>Total</b>	<b>8,230,226</b>	<b>10,240,213</b>	<b>198,200</b>	<b>524,367</b>

Ageing of financial assets that are past due but not impaired for 2009

	0 to 30 days \$	31 to 60 days \$	61 to 90 days \$	90+ days \$	Total \$
<b>Loans and receivables</b>					
Trade and other receivables (gross)	104,224	43,463	7,245	43,268	198,200
<b>Total</b>	<b>104,224</b>	<b>43,463</b>	<b>7,245</b>	<b>43,268</b>	<b>198,200</b>

Ageing of financial assets that are past due but not impaired for 2008

	0 to 30 days \$	31 to 60 days \$	61 to 90 days \$	90+ days \$	Total \$
<b>Loans and receivables</b>					
Trade and other receivables (gross)	381,670	41,823	30,785	70,089	524,367
<b>Total</b>	<b>381,670</b>	<b>41,823</b>	<b>30,785</b>	<b>70,089</b>	<b>524,367</b>

## Note 14: Financial Instruments (continued)

### Note 14D: Liquidity risk

ARPANSA's financial liabilities are payables. The majority of ARPANSA's funding is appropriated from the Australian Government. The Agency manages its budgeted funds to ensure it has adequate funds to meet payments as they fall due. In addition, ARPANSA has policies in place to ensure timely payments are made when due and has no past experience of default. ARPANSA does not expect to have difficulty meeting its financial liabilities as and when they become due and payable.

The following tables illustrates the maturities for financial liabilities.

	within 1 year 2009 \$'000	1 to 5 years 2009 \$'000	> 5 years 2009 \$'000	Total 2009 \$'000
Payables - suppliers	492,940	-	-	492,940
Other payables	619,399	-	-	619,399
Total	1,112,339	-	-	1,112,339

	within 1 year 2008 \$'000	1 to 5 years 2008 \$'000	> 5 years 2008 \$'000	Total 2008 \$'000
Payables - suppliers	330,212	-	-	330,212
Other payables	431,952	-	-	431,952
Total	762,164	-	-	762,164

As at 30 June 2009, ARPANSA has no financial liabilities payable on demand (2008: nil).

### Note 14E: Market Risk

#### Currency Risk

ARPANSA's exposure to "Currency Risk" is minimal as only a small number of contracts are in currencies other than Australian Dollars.

#### Interest Rate Risk

ARPANSA's financial instruments are not exposed to interest rate risk.

## Note 15: Appropriations

In accordance with section 56 of the *Australian Radiation Protection and Nuclear Safety Act 1998*, all monies received by ARPANSA are to be paid into the ARPANSA Special Account. Pursuant to this section, all monies paid into this Account are automatically appropriated for the use of ARPANSA.

**Table A: Acquittal of Authority to Draw Cash from the Consolidated Revenue Fund for Ordinary Annual Services Appropriations and borrowings**

Particulars	Departmental Outputs	
	2009	2008
	\$	\$
Balance carried from previous period	3,795,000	4,097,000
Appropriation Act:		
Appropriation Act (No.1)	15,616,000	15,795,000
Appropriation Act (No.3)	-	-
Total appropriation available for payments	19,411,000	19,892,000
Cash payments made during the year (GST inclusive)	15,295,000	16,097,000
Balance of Authority to Draw Cash from the Consolidated Revenue Fund for Ordinary Annual Services Appropriations	4,116,000	3,795,000
<i>Represented by</i>		
Departmental appropriations receivable	4,116,000	3,795,000
<b>Total</b>	<b>4,116,000</b>	<b>3,795,000</b>

**Table B: Acquittal of Authority to Draw Cash from the Consolidated Revenue Fund for Other than Ordinary Annual Services Appropriations**

Particulars	Non - operating	
	Equity	
	2009	2008
	\$	\$
Balance carried from previous period	3,200,000	-
Appropriation Act:		
Appropriation Act (No.2)	-	3,600,000
Total appropriations available for payments	3,200,000	3,600,000
Cash payments made during the year (GST inclusive)	2,700,000	400,000
Balance of Authority to Draw Cash from the Consolidated Revenue Fund for Ordinary Annual Services Appropriations	500,000	3,200,000
<i>Represented by</i>		
Departmental appropriations receivable	500,000	3,200,000
<b>Total</b>	<b>500,000</b>	<b>3,200,000</b>

## Note 16: Special Accounts

ARPANSA Special Account (Departmental)	2009	2008
	\$	\$
Legal Authority: <i>ARPANS Act 1998; s56(4)</i>		
Appropriation: <i>Financial Management and Accountability Act 1997; s21</i>		
<i>Purpose:</i> The purpose of the Special Account is set out in the ARPANS Act at section 56(4):  "The purposes of the Special Account are to make payments: (a) to further the object of this Act (as set out in section 3); and (b) otherwise in connection with the performance of the CEO's functions under this Act or the Regulations."  		
Balance carried from previous period	2,328,211	2,147,746
Appropriation Act (No.1)	15,295,000	16,097,000
Appropriation Act (No.3)	-	-
Capital Injection	2,700,000	400,000
GST credits (FMA Act s30A)	660,180	288,520
Other receipts	9,907,434	9,521,455
<b>Available for payments</b>	<b>30,890,825</b>	28,454,721
Payments made to employees	14,105,307	14,292,468
Payments made to suppliers	14,136,516	11,834,042
Repayment of debt	-	-
Total debits	28,241,823	26,126,510
<b>Balance carried to next period</b>	<b>2,649,002</b>	2,328,211
<i>Represented by:</i>		
Cash – held by the Agency	2,649,002	2,328,211
<b>Total balance carried to the next period</b>	<b>2,649,002</b>	2,328,211

### Note 17: Reporting of Outcomes

All ARPANSA's transactions fall within Outcome 1, "The Australian people and the environment are protected from the harmful effects of radiation"

#### Note 17A: Net cost of outcome delivery

	Outcome	
	2009	2008
	\$	\$
<b>Expenses</b>		
Departmental	24,857,350	23,394,929
<b>Total expenses</b>	<b>24,857,350</b>	<b>23,394,929</b>
<b>Costs recovered from provision of goods and services to the non-government sector</b>		
Departmental	5,075,470	4,853,861
<b>Total costs recovered</b>	<b>5,075,470</b>	<b>4,853,861</b>
<b>Other external revenues</b>		
Licence fee revenue from related entities	3,501,727	3,966,154
Goods and services revenue from related entities	404,248	151,384
<b>Total other external revenues</b>	<b>3,905,975</b>	<b>4,117,538</b>
<b>Net cost/(contribution) of outcome</b>	<b>15,875,905</b>	<b>14,423,530</b>

#### Note 17B: Major classes of departmental revenues and expenses by output groups

Outcome	Output Group 1		Output Group 2		Output Group 3		Outcome	
	National Leadership		Knowledge Information and Services		Regulation		Total	
	2009	2008	2009	2008	2009	2008	2009	2008
	\$	\$	\$	\$	\$	\$	\$	\$
<b>Departmental expenses</b>								
Employees	2,924,737	2,646,679	7,908,390	8,634,925	3,549,052	3,447,633	14,382,179	14,729,237
Suppliers	2,547,151	2,365,057	4,427,762	3,579,068	1,659,173	1,474,816	8,634,086	7,418,941
Depreciation and amortisation	335,312	238,839	1,172,300	792,241	288,861	165,194	1,796,473	1,196,274
Other expenses	600	5,164	43,013	42,426	999	2,887	44,612	50,477
<b>Total departmental expenses</b>	<b>5,807,800</b>	<b>5,255,739</b>	<b>13,551,465</b>	<b>13,048,660</b>	<b>5,498,085</b>	<b>5,090,530</b>	<b>24,857,350</b>	<b>23,394,929</b>
<b>Funded by:</b>								
Revenue from government	4,197,972	3,954,657	9,421,670	10,715,967	1,996,358	1,124,376	15,616,000	15,795,000
Sales of goods and services	1,609,828	1,301,082	3,869,890	3,704,163	-	3,966,154	5,479,718	5,005,245
Other non-taxation revenues	-	-	-	-	3,501,727	3,966,154	3,501,727	3,966,154
<b>Total departmental revenues</b>	<b>5,807,800</b>	<b>5,255,739</b>	<b>13,291,560</b>	<b>14,420,130</b>	<b>5,498,085</b>	<b>5,090,530</b>	<b>24,597,445</b>	<b>24,766,399</b>

- The variance between revenue and expense in Output Group 2 reflects ARPANSA's surplus in 2007-08 and loss in 2008-09, less gains which are not reflected in this note.

- The split between Outputs Groups is based on the activities undertaken by the branches/sections within ARPANSA



## INDEPENDENT AUDITOR'S REPORT

To the Parliamentary Secretary to the Minister for Health and Ageing

### Scope

I have audited the accompanying financial statements of the Australian Radiation Protection and Nuclear Safety Agency (the Agency) for the year ended 30 June 2009, which comprise: a Statement by the Chief Executive and Chief Financial Officer; Income Statement; Balance Sheet; Statement of Changes in Equity; Cash Flow Statement; Schedule of Commitments; Schedule of Contingencies; and Notes to and forming part of the Financial Statements, including a Summary of significant accounting policies.

### *Responsibility of the Chief Executive for the Financial Statements*

The Chief Executive of the Agency is responsible for the preparation and fair presentation of the financial statements in accordance with Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*, including Australian Accounting Standards (which include Australian Accounting Interpretations). This responsibility includes establishing and maintaining internal controls relevant to the preparation and fair presentation of the financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

### *Auditor's Responsibility*

My responsibility is to express an opinion on the financial statements based on my audit. I conducted my audit in accordance with Australian National Audit Office Auditing Standards, which incorporate Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Agency's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Agency's internal control. An audit also includes evaluating the appropriateness of

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accounting policies used and the reasonableness of accounting estimates made by the Agency, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

***Independence***

In conducting the audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

**Auditor's Opinion**

In my opinion, the financial statements of the Australian Radiation Protection and Nuclear Safety Agency:

- (a) have been prepared in accordance with Finance Minister's Orders made under the *Financial Management and Accountability Act 1997*, including Australian Accounting Standards; and
- (b) give a true and fair view of the matters required by the Finance Minister's Orders including the Australian Radiation Protection and Nuclear Safety Agency's financial position as at 30 June 2009 and its financial performance and cash flows for the year then ended.

Australian National Audit Office



P Hinchey  
Senior Director  
Delegate of the Auditor-General

Sydney  
9 September 2009

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## Abbreviations

ABC	Australian Broadcasting Corporation
ACRBR	Australian Centre for Radiofrequency Bioeffects Research
ANRDR	Australian National Radiation Dose Register
ANSTO	Australian Nuclear Science and Technology Organisation
APS	Australian Public Service
ARGOS	Accident Reporting and Guidance Operational System
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
AWA	Australian Workplace Agreements
BOM	Bureau of Meteorology
CBRN	Chemical Biological Radiological and Nuclear
CEO	Chief Executive Officer
CLC	common law contract
COAG	Council of Australian Governments
CPGs	Commonwealth Procurement Guidelines
CSA	Compliance Self Assessment
CSS	Commission on Safety Standards
CT	computed tomography
CTBT	Comprehensive Nuclear-Test-Ban Treaty
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organisation
DRLs	diagnostic reference levels
ELF	extremely low frequency
EME	electromagnetic energy
EMF	electric and magnetic fields
EU	European Union
FMA Act	<i>Financial Management and Accountability Act 1997</i>
FOI Act	<i>Freedom of Information Act 1982</i>
HIFAR	High-Flux Australian Research Reactor
IAEA	International Atomic Energy Agency
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICRP	International Commission on Radiological Protection
ICT	information and communication technology
IM	information management
KPIs	key performance indicators
L&D	learning and development training framework
linac	medical linear accelerator
LLILW	long-lived intermediate level waste
MDCT	multidetector computed tomography

NATA	National Association of Testing Authorities
NCA	National Competent Authority
NDRP	Directory for Radiation Protection
NEA	Nuclear Energy Agency
NHMRC	National Health and Medical Research Council
NORM	naturally occurring radioactive material
NPL	National Physical Laboratory
NUSSC	Nuclear Safety Standards Committee
OECD	Organisation for Economic Co-operation and Development
OH&S	Occupational Health and Safety
OHS (CE) Act	<i>Occupational Health and Safety (Commonwealth Employees) Act 1991</i>
OPAL	Open Pool Australian Light-water [research reactor]
PRMS	Personal Radiation Monitoring Service
QMC	Quality Management Committee
RAC	Renovation Advisory Committee
RANZCR	Royal Australian and New Zealand College of Radiologists
RASSC	Radiation Safety Standards Committee
RF	radiofrequency
RHC	Radiation Health Committee
RHS	Radiation Health Series
RPS	Radiation Protection Series
SCF	Staff Consultative Forum
SES	Senior Executive Service
SPERA	South Pacific Environmental Radioactivity Association
the ARPANS Act	<i>Australian Radiation Protection and Nuclear Safety Act 1998</i>
the Council	Radiation Health and Safety Advisory Council
TRANSSC	Transport Safety Standards Committee
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UPF	ultraviolet protection factor
UVR	ultraviolet radiation
WASSC	Waste Safety Standards Committee
WHO	World Health Organization

## Glossary

### absorbed dose

The energy absorbed per unit mass by matter from ionizing radiation which impinges upon it.

### accident

An unintended event which causes, or has the potential to cause, employees or members of the public to be exposed to radiation from which the individual doses or collective doses received do not lie within the range of variation which is acceptable for normal operation. An accident may result from human error, equipment failure or other mishap; it may require emergency action to save life or to safeguard health, property or the environment; it requires investigation of its causes and consequences and, possibly, corrective action within the program for control of radiation; and it may require remedial action to mitigate its consequences.

### activity

The measure of quantity of radioactive materials, except when used in the term 'human activity'.

### air kerma

The measure of the energy released in a volume of air at some distance from a radioactive source.

### anthropomorphic

A model of the human body used to mimic the interaction between radiation with human anatomy.

### AS/ISO

Standard established by Standards Australia and the International Organization for Standardization.

### biodosimetry

Post exposure measurement of radiation dose of biological material such urine and blood samples.

### bio shield

A concrete barrier which shields radiation from the reactor core and prevents exposure to personnel.

### carcinogenesis

The induction of a cancer.

### chromatographic

An analysis method used separate chemical mixtures.

### Code of Practice for radiation protection

A document prescribing specific requirements for radiation protection in a particular application.

### controlled apparatus – as defined in the ARPANS Act

- (a) An apparatus that produces ionizing radiation when energised or that would, if assembled or repaired, be capable of producing ionizing radiation when energised
- (b) An apparatus that produces ionizing radiation because it contains radioactive material, or
- (c) An apparatus prescribed by the regulations that produces harmful non-ionizing radiation when energised.

### controlled material– as defined in the ARPANS Act

Any natural or artificial material, whether in solid or liquid form, or in the form of a gas or vapour, which emits ionizing radiation spontaneously.

**constraint**

Either dose constraint in the case of exposures anticipated to be received, or risk constraint in the case of potential exposures (see dose constraint and risk constraint).

**dose**

A generic term which may mean absorbed dose, equivalent dose or effective dose depending on context.

**dose constraint**

A prospective restriction on anticipated dose, primarily intended to be used to discard undesirable options in an optimisation calculation.

In occupational exposure, a dose constraint may be used to restrict the options considered in the design of the working environment for a particular category of employee.

In medical exposure, a dose constraint for volunteers in medical research may be used to restrict the options considered in the design of an experimental protocol.

In public exposure, a dose constraint may be used to restrict the exposure of the critical group from a particular source of radiation.

**dosemeters**

An instrument used to determine the presence and sometimes the amount of radiation.

**dosimetry**

The theory and application of the principles and techniques involved in the measurement and recording of radiation doses.

**effective dose**

A measure of dose which takes into account both the type of radiation involved and the radiological sensitivities of the organs and tissues irradiated.

**electromagnetic energy**

The energy stored in an electromagnetic field. Expressed in joule (J).

**EMF**

Electromagnetic fields.

**equivalent dose**

A measure of dose which takes into account the type of radiation involved.

**exclusion**

In the context of assessing radiation exposure, the deliberate omission of a specified component, or components, of total exposure to radiation. In a regulatory context, the acknowledgment that a particular radiation source is not amenable to control.

**exemption**

The deliberate omission of a practice from regulatory control, or from some aspects of regulatory control, by the appropriate authority.

**exposure**

The circumstance of being exposed to radiation.

**extremely low-frequency (ELF) radiation**

Has very long wavelengths (in the order of a thousand kilometres or more) and frequencies in the range of 100 hertz or less.

**gamma ray**

Ionizing electromagnetic radiation emitted by a radionuclide during radioactive decay or during a nuclear (isomeric) transition.

**graphite calorimeter**

A device used to measure ionizing radiation dose from the temperature rise in a graphite block.

**gray (Gy) and (mGy.cm)**

Unit used to measure absorbed dose.

Milligray (mGy) is one thousandth of a gray (1/1,000). mGy.cm amount of mGy delivered over the length of the scan.

**incident**

An event which causes, or has the potential to cause, abnormal exposure of employees or of members of the public and which requires investigation of its causes and consequences and may require corrective action within the program for control of radiation, but which is not of such scale as to be classified as an accident.

**ion**

An atom in a charged state following ionization.

**ionization**

The process by which one or more electrons are removed from, or sometimes added to, an atom leaving the atom in a charged state.

**ionizing radiation**

Radiation which is capable of causing ionization, either directly (for example: for radiation in the form of gamma rays and charged particles) or, indirectly (for example: for radiation in the form of neutrons).

**ISO Series**

Internationally accepted standards developed by the International Organization for Standardization which is a network of the national standards institutes of 157 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system.

**justification**

The notion that human activities which lead to exposure to radiation should be justified, before they are permitted to take place, by showing that they are likely to do more good than harm.

**licence**

A written authorisation issued to an operator which allows the operator to carry out an operation legally.

**limitation**

The requirement that radiation doses and risks should not exceed a value regarded as unacceptable.

**linac – linear particle accelerator**

A device used to produce highly penetrating radiation for calibrating radiotherapy dosimeters used in medicine for the treatment of cancer.

**linear-non-threshold (LNT) model**

A dose-response model which is based on the assumption that, in the low dose range, radiation doses greater than zero will increase the risk of excess cancer and/or heritable disease in a simple proportionate manner.

**medical exposure**

Exposure of a person to radiation received as a patient undergoing medical diagnosis or therapy, or as a volunteer in medical research, or non-occupational exposure received as a consequence of assisting an exposed patient.

**milliSievert**

Unit used to measure equivalent dose. A milliSievert (mSv) is one thousandth of a Sievert (1/1,000).



**noble gas**

a group of chemical elements that possess extremely low chemical reactivity.

**noble gas radionuclide detection system**

A vacuum system that measures the concentration activity of radioactive xenon isotopes in the atmosphere.

**non-ionizing radiation**

Ranges from extremely low frequency radiation, shown on the far left through the radiofrequency, microwave, and visible portions of the spectrum into the ultraviolet range.

**occupational exposure**

Exposure of a person to radiation which occurs in the course of that person's work and which is not excluded exposure.

**operator**

Any person or entity responsible for an operation which may lead to exposure to ionizing radiation.

**optimisation**

The process of maximising the net benefit arising from human activities which lead to exposure to radiation.

**person-sievert**

The unit used for collective dose. A measure of the total radiation exposure of a population which is calculated by summing the individual effective doses.

**program of radiation protection**

An instance of a system of radiation protection, designed for a particular operation.

**public exposure**

Exposure of a person, or persons, to radiation which is neither occupational nor medical exposure.

**radiation**

Electromagnetic waves or quanta, and atomic or sub-atomic particles, propagated through space or through a material medium.

**radiation weighting factor**

A factor which modifies absorbed dose in an organ or tissue to yield equivalent dose and which is determined by the type and energy of the radiation to which the organ or tissue is exposed.

**radioactive decay**

The spontaneous transformation of the nucleus of an atom into another state, accompanied by the emission of radiation; for a quantity of such atoms, the expectation value of the number of atoms present decreases exponentially with time.

**radioactive material**

Material which spontaneously emits ionizing radiation as a consequence of radioactive decay.

**radiofrequency (RF)**

Electromagnetic energy with frequencies in the range 3 kHz to 300 GHz.

**radiological emergency**

An emergency in which there is, or is perceived to be, a hazard due to:

- (a) the energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction, or
- (b) radiation exposure.

**radionuclide**

A species of atomic nucleus which undergoes radioactive decay.

**radiopharmaceutical**

A radioactive pharmaceutical administered to patients for medical diagnosis or therapy.

**RF field**

A physical field, which specifies the electric and magnetic states of a medium or free space, quantified by vectors representing the electric field strength and the magnetic field strength.

**Regulatory Impact Statement**

A Regulation Impact Statement (RIS) is required, under the Australian Government's requirements, when a regulatory proposal is likely to have significant impacts on business and individuals or the economy. The primary role of the RIS is to improve government decision-making processes by ensuring that all relevant information is presented to the decision maker when a policy decision is being made. A RIS is prepared for each of ARPANSA's Codes of Practice and Standards and contains a cost benefit analysis.

**sievert (Sv)**

The special name for the SI unit of equivalent dose, effective dose, and operational dose quantities. The unit is joule per kilogram ( $\text{J kg}^{-1}$ ).

**solaria**

Salons for artificial sun tanning through exposure to ultraviolet radiation.

**stochastic effects of radiation**

Malignant disease and heritable effects for which the probability of an effect occurring, but not its severity, is regarded as a function of dose without threshold.

**system of radiation protection**

A generic process of radiation risk management designed to limit the health risks arising from exposure to radiation to acceptable levels in a manner which takes economic and social considerations into account.

**tissue weighting factor**

A factor which modifies equivalent dose in an organ or tissue to account for the sensitivity of the organ to different types of radiation.

**X-ray**

Ionizing electromagnetic radiation emitted during the transition of an atomic electron to a lower energy state or during the rapid deceleration of a charged particle.

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